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NEWS IN BRIEF

BM denies cancer risk

IBM has denied reports by the Banking Insurance and Finance Union that a toning substance used in its 3800 laser printer is a possible carcinogen.

Union research assistant Andy Egan said cautionary advice in his membership was based on a US Environmental Protection Agency report which indicated that the toning substance active principle (trinitrofluorene "TNF") was potentially hazardous.

Zilog presidency

Zilog President Federico Faggin, has been moved to Exxon Enterprises' board, assuming control of the parent company's new Computer Systems group.

Zilog vice-president Manuel Fernandez will take over the nominal presidency but will report directly in Faggin, who retains control over Zilog's future.

Zilog has denied any connection between the managerial changes and losses made by the company until earlier this year.

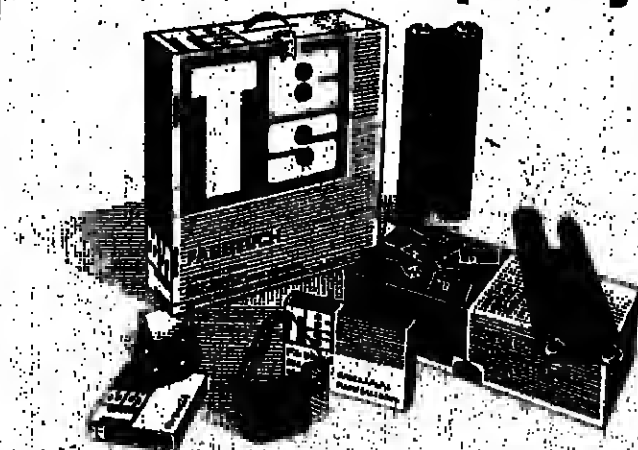
Phones for BBC

PYE Business Communications of Cambridge has announced a contract to supply the BBC with two computerised EBX8000 telephone exchanges. The contract is worth £2 million and the exchanges are scheduled for installation in BBC offices at Ealing and Shepherds Bush by mid-1982.

Fieth failure

A CASH shortage at point-of-sale supplier Fieth Ltd led to the liquidators being called in last Wednesday. Television owned 40% of company shares and have accepted a £600,000 write-off in relation to Fieth, whose assets along with 30 staff have been acquired by UCSL Microsystems, a Unilever subsidiary.

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Flexible leases warning

SERIOUS warnings about the risks for computer users who take out what are commonly referred to as "flexible leases" have come from the prestigious Law Society Gazette, the weekly newspaper read by the majority of solicitors.

Based on the experience of a solicitor who acted for a prospective flexible leasing customer, the Gazette article in the November 12 edition, highlights the danger that arises when the early termination clause offered by the flexible lessor is separate from the main agreement with the ultimate lessor - the organisation that finances the lease.

Flexible leases enable a lessee to terminate a seven-year lease after three or four years, but only if he replaces it with a machine from the flexible lessor. Lessees are urged in the article to check that the minimum lease term on the second machine is stated in the main agreement, and that its lease rate is quoted in unambiguous terms.

The Gazette article points out that the company financing the lease has a seven-year lease which it considers to be binding, and that any request for cancellation will inevitably be met by the requirement to pay the balance of the outstanding rentals discounted at a market rate.

The article says that the lessee may be left in a difficult position dependent upon the flexible leasing company staying in business and honouring its obligations. If the flexible leasing company is wound up, the lessee will be left with a long-term obligation on the original machine.

It adds that even if the flexible option is exercised, the lessee will probably be committed to a second machine on financial terms which will by then have become very disadvantageous.

The article concludes that unless flexible leasing companies "put their own house in order", legislation will be enacted to curb their activities.

The best known flexible lessor in the UK, Atlantic Leasing, refused to comment on any of the points made in the article except to say that it "generally" and was "directed at the seven or eight companies" in the flexible leasing business.

Type approval to go outside BT

THE power to approve or disapprove equipment for attachment to the telephone network, and also to license added-value services and the resale of transmission capacity, is to be given to the Secretary for Industry under the terms of the government's bill, just published, which sets up British Telecommunications as a separate body from the Post Office.

In practice, type approval is to be carried out by an independent body acting "in consultation" with BT, expected to be either the British Standards Institution or the British Electrical Approvals Board.

Under the Bill, which is expected to become law by next summer, British Telecom would have the right to maintain all PABXs and the first telephone instrument on any line, but is expected to subcontract much of this work to private industry.

BT has expressed keenness for getting into partnership with in-

dustry over this, especially concerning software-based systems.

The Industry Secretary would have power under the Bill to overrule the new corporation's decisions on maintainability of equipment and charges if he feels that "undue discrimination" is being exercised.

Competing

In announcing that BT would have power to raise private capital for its investment programme but not by share flotation, Industry Secretary Sir Keith Joseph said he was even more chary of private monopolies than public ones. Partnerships like those entered into by BP would probably be involved.

The Post Office is empowered under the Bill to provide electronic mail services that involve collection and delivery of hard copy. This could lead to BT and the Post Office providing competing services.

Amdahl launches H-series competitor

British Airways is already a major Amdahl user.

Paralleling to some extent IBM's other moves at the time of the 3081 launch, Amdahl has cut the purchase prices of 470 machines by around 15% and added a bottom end model to the 470 family. Called the 470V7C, it is a degraded 7B and offers a performance comparable with the IBM 3033S. It can be field upgraded right up to the V8 in the same way that a 3033S can end up as a 3033MP.

Commenting on the purchase

price cuts, Peter Williams said that Amdahl's lease/purchase ratio on 470s was still well over 20, much higher than the new ratios on the 303X family.

But Amdahl customers wanting to replace their 470s with 580s will have to wait until April 1982 for first deliveries. Shipments of the 3081 (previously called the 3801 in part of last week's story due to a printing error) will start before the end of 1981.

As with the 3081, the 580 incorporates componentry with a substantial improvement in circuit density. The Fujitsu manufac-

Burroughs to lay off 335 staff

FALL in demand for document encoding equipment and some line printers has led Burroughs to announce plans to lay off 335 staff in its Cumbernauld plant in Scotland from next February. But the cuts are being offset in part by setting up a production line in Cumbernauld for the new B900 small business machine.

Research and development at Cumbernauld is not being reduced, and the company asserts that demand for the other products it manufactures in the UK such as floppy discs, terminals and business forms is expanding.

The encoder made at Cumbernauld are used mainly in banking for printing on to cheques; the line printers are the 9249 series.

Record level

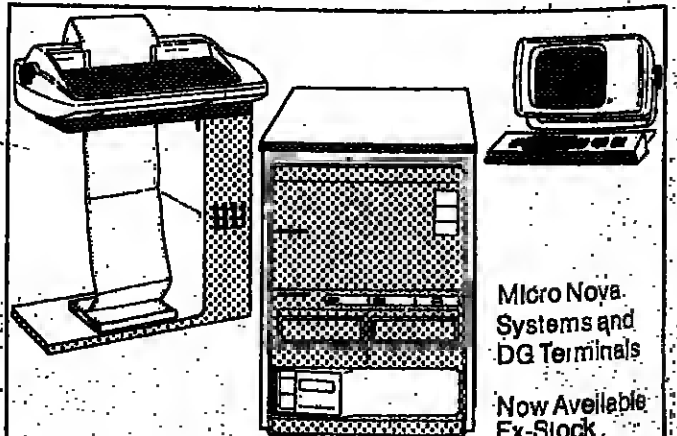
To obtain this throughput and to get the system operational required major changes in ICL's VME/B intercommunications with IDMS.

A joint ICL/NMWW team has been working on the problem for a year and developed a record level journalising feature for IDMS which is now on general release.

The stockbroking system uses a dual database concept with the main database updated at night and daily transactions processed across an abstract of the database during the day.

Capital is intended to run eventually on a single database updated "on the fly" and with additional inquiry facilities.

Capital took four years to de-



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ALL-BRITISH SYSTEM TO GO LIVE FOR REAL TIME STOCKBROKING

World first in share dealing

by Kevin Cahill

THE first real time stockbroking service in the world will go live at Cumbernauld NMWW next Monday. Called Capital, the system will provide real time processing including the production of share contracts for 35% of all UK-based Stock Exchange transactions.

Based on twin ICL 2972s, it has been designed around database management system IDMS and what is described as a unique version of ICL's transaction processing system called TPO 100, running under the VME/B operating system.

The software routes traffic through the system at the rate of 18 message pairs per second with planned throughput of three pairs per second.

The uniprocessor and the multiprocessor are designated the 5660 and 5680, respectively, the latter machine providing about 3.5 times the power of the V8 while costing less than £4 million.

As with the IBM 3081, the 580 employs 16K RAMs in main memory and intermixes special purpose RAM chips on the same boards as logic chips. They could be RAMs for registers, buffer storage or microcode.

With the 580, Amdahl has also announced what it describes as "a new class of firmware" called Macrocode.

velop and cost £3 million, associated central hardware costing a further £3 million. The system completed parallel running into NMWW client offices last Friday.

NMWW is the only bureau supplying an online link to the Stock Exchange's Talisman system outside London.

All-inclusive

NMWW managing director Brian Johnson explained that Capital's predecessor had been a mixture of real time input and updating with output such as share-dealing contracts provided every 30 minutes on a batch basis.

Capital would supply everything - input, ledger updating and do-

cumentary output - in real time.

"It was comparable," Johnson said, "to no airline booking system if you could think of any airline that had 400 planes in the air at once."

Capital holds details of 20,000 UK quoted stocks and 35,000 overseas stocks in its central database, the system operating in any currency.

NMWW is online in over 100 brokers offices in the UK and Ireland and services an end-client base of over 800,000 users.

"NMWW's profits this year will be the highest in the company's history," according to Johnson. Previous highest results were in 1977 with pre-tax profits of £415,603.

First 16-bit machine from Datapoint

A FRESH challenge in the huge commercial microcomputer market has appeared in the shape of a powerful new machine from US company Datapoint. Its UK distributor, Ventek, has revealed next spring as the launch date for Datapoint's first 16-bit processor, representing the company's expected move up-market to match competition like Wang's VS systems and the Data General CS/300.

In line with many other 16-bit machine manufacturers Datapoint

has included bit-slice technology in the componentry of the 8800. The machine's architecture consists of a central processor with up to one megabyte of main memory linked to separate peripheral processors by a high speed bus and direct memory access channels.

The most important new software offering with the 8800, which has already been announced in the US, is a new operating system called RMS, Resource Management System.

It can run either in standalone mode or as part of a Datapoint Attached Resource Computer environment where several machines and their shared peripheral devices are linked by a central cable. In addition to multi-tasking and multi-programming RMS provides facilities like hierarchical user defined levels of security and what are said to be virtually unlimited file names.

RMS is also supported by Datapoint's previous top end machine, the 6600, and can share the same ARC links as the existing Datapoint operating system, DOS. This facility enables unconverted files and programs to be used until new ones have been produced.

US prices for the 8800 include \$88,000 for a 256K machine with a 202-megabyte disc drive.

Briefing Thomson to shed 5,000

FRENCH telecommunications manufacturer Thomson CSF has begun a redundancy programme designed to shed 5,000 staff between now and 1983. Planning to avoid outright sackings if possible, it has offered voluntary redundancy payments of 15 months' salary which is expected to attract 2,000 volunteers, and has agreed premature retirement on 70% of pay for employees over 56.

ICL jobs

IN our story on ICL redundancies on the front page last week we wrongly stated that the company had already issued redundancy notices. In fact, it announced that a 90-day consultation period with the unions involved had started. Redundancy notices will follow for staff who cannot be redeployed. See page 8.

£12½m plans

THE House of Fraser retail group has announced that its board has approved a £12½ million programme for a computer-based management information system that will embrace order processing, stock control, salaries and buying.

PSS for UK banks

THE acceptability of the public packet switching networks to the banking industry has been given a boost by a decision of the UK clearing banks to use British Telecom's Packet Switched Service.

PSS will link the banks' mainframe systems to the new decentralised version of the Clearlog Houses Automated Payments System, Chaps.

Chaps in its original form, with a central ICL 2960 mainframe, was scrapped early this year just before it was due to go live.

A spokesman for the new Chaps

Puzzler for 'cross' winner

GOOD luck in a Computer Weekly crossword competition turned sour for winner David Yates when his luggage was broken into and his first prize stolen.

Yates, who works in the National Physical Laboratory computer division at Teddington, won a Commodore Pet donated by Master Resources for solving our first crossword last November.

Thieves broke into his Richmond home and stole the 8K pet with a television set and photographic equipment worth £1,000.

"They seemed to know exactly what they were after - high technology stuff. I don't suppose we'll get the cameras and television back, but the Pet won't be quite so easy to get rid of."

Yates is doubly keen to reclaim his microcomputer as the thieves missed his tape library, including Basic programs jointly composed with his son.

Should anyone offer you Commodore Pet serial no 100579, contact Richmond Police on 01-940 9595.



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Turn Quay System

Tilbury Container Services operate the world's largest refrigerated container facility at Tilbury Docks in Essex. Their microcomputer-based container control system is now an essential part of the daily routine. Visual displays provide interactive cargo planning, taking into account variables such as cargo characteristics and destination. Several hundred thousand units are handled annually.

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GILB'S MYTHODOLOGY

Seek simpler solutions by defining real needs

ONE factoring company, clients of ours, wanted a new system designed with a stipulation that Cobol be used. We felt that this requirement conflicted with our ability to satisfy the even more important consideration, of lower unit costs per transaction.

Our appraisal envisaged a major architectural strategy of using minicomputers, and Cobol was not a major or efficient language on minis at that time.

Our clients reasoned that, if the "mini" architecture did not work out satisfactorily, they could move the new system back to the large-scale computers they were accustomed to using on a service bureau basis.

In other words, they wanted a safety line, or a retreat possibility. They did not really care about Cobol; they wanted peace of mind.

Even more important, they wanted low costs in the new system. This was the primary element needed for profitability and competitiveness.

We calculated roughly, that using Cobol would double costs compared to Basic or Fortran. This is not a general assertion about the languages but seemed to be the case with minis at this time.

We requested and received agreement to reformulation of the client's needs, and agreed to design and build the system so that it was 98% portable, whatever the machine we ultimately used, to large-scale IBM machines. In other words, a maximum 2% additional cost would be necessary for converting the programs to larger-scale machines. Briefly, even if real costs were not so optimistic, there would be no insurmountable practical barrier to conversion.

We were not adamant about this. We judged the probability of needing conversion to be very low, but avoided having Cobol costs imposed on us. The penalty was that we had to specify a restricted, "portable" use of the programming language we chose finally.

Insurance

A large Nordic life insurance company was dissatisfied with the ease of maintenance and operational cost level of its entire life insurance system. Its basic plan called for a complete redevelopment of life insurance computerised systems, a project clearly involving many hundreds of work years.

The director of data processing was concerned about the size of the planned project. We made a concerted effort to identify the highest priority needs, and several points emerged.

They were to reduce cost level by at least 4%, improve substantially the ability to implement changes and improvements in the system, and cut the time factor between data birth (with salesmen and clients) and when the computerised system knew about this new data. Instead of a fortnight, the clients would have liked to see the operation done in three days or less.

One obvious way to approach these goals was to redesign and reprogram the entire life insurance system. It might take three to ten

years, and 100 and more DP specialists to do this, but the clients were considering this reluctantly as the only viable way.

Once we started concentrating on looking for evolutionary steps to achieve these goals, a number of short-term strategies emerged which would begin to move the insurance company in the right direction, without the burden of tremendous and uncertain revolutionary developments.

An initial specific strategy was the use of INSPECTION (Pagan/IBM quality control of all changes and extensions) which was given substantial productivity (cost) and quality improvements in large maintenance environments.

We identified the use of deep database audit programs for improving maintenance effectiveness and reliability by means of automation as another possibility.

Message

The initial attractiveness of both these solutions was that they gave known results in the right direction without the necessity of changing currently used applications.

We identified additional attractive change paths in a more extensive study such as using online



Tom Gilb is an independent consultant, lecturer and author on computing topics.

microcomputers at salesman level to capture data at customer homes and in sales offices. These would replace present handwritten forms which caused much of the presently experienced delay and cost. Again the attraction of this was that we could add it to the present system without having to change the automated system.

In this short example I cannot identify all the "real" goals that we identified, or all the simplified solutions compared to doing the whole system over.

The message here is that in the eyes of this company we found a large number of "simpler" solutions identifying their "real" needs clearly. The next stage was to look for a series of ways to move in the direction of achieving those goals.

Gilb's Hypothesis: If your solution seems to be too complicated, look for simpler approaches by first asking: What are our real needs. This will allow you to find a simpler set of solutions to your problem.

Downtime

by Chad

Music hath chips?

TOM CARPENTER of Guernsey wrote to the Daily Another Newspaper suggesting that "in this age of microchips it is possible to banish the chap waving his arms about in front of the orchestra."

Continued Carpenter: "All that is required is a set of small coloured lights on each musician. These would be governed by a cassette programmed by the arm-waver in the comfort of his study. Each instrumentalist would soon learn to co-ordinate the individual flickering, waxing and waning lights with the score."

What Carpenter's proposal is intended to achieve I am not quite sure. In these days of cuts in the arts budget it would be nice to save the conductor's fee.



but in this case that does not happen because he has to do the conducting at home anyway.

Repeat performances are saved, I suppose, and his travelling expenses, but surely there is much more scope for economy on the shop floor, so to speak?

There was a well-known study of a symphony orchestra by an efficiency expert, who recommended that since the English horn player and the harpist had little to do, their parts should be combined. He also suggested that the slow movements should be speeded up, thereby getting the work done in much less time.

Carpenter's idea is unusual in that it gets rid of management rather than workers, something not very popular with managers. It raises the prospect of a shop floor revolution.

What would happen if the players all decided to ignore the flashing lights and put the batons and pizzicatos in unauthorised places? Since Sir Thomas Beecham is already spinning, in his grave like a propeller shaft, I suppose the rumbling noise in the Royal Albert Hall would just get a bit worse.

It seems to me that the real potential for microchips would be in rendering the process of music making not quite so economically difficult as it is now. I have spent many years struggling to learn to play the piano, and the process of translating the dots on the paper into positions of the fingers in real time seems positively complicated (mainly because I've never been able to do it).

It seems to me it should be possible to devise a mechanism that would handle the digital side of playing a piano, say, while leaving the analogue side (the artistic interpretation, don't you know?) to the human. The machine would read the notes and set itself up ready to play each chord, and then play it when you pressed a single button, thus saving you having to muddle through several fingers at once. How hard you pressed the button determines the loudness.

My musical friends are horrified at the idea. But why should this art fall behind in the March of Progress?

INFOTECH STATE OF THE ART REVIEW

Integrated office with a difference

WAITING for a big firm to produce a true integrated office automation system is like waiting for Godot - it will never happen.

That was the opinion voiced at Infotech's State of the Art Review by John Eilenby, president of Grid Systems of Silicon Valley, and it is hardly surprising.

Eilenby has just started his company to produce an integrated office which he claims will have "unique characteristics".

Eilenby was at Xerox Palo Alto Research Centre until last January supervising development of the Alto personal computer; he has enlisted no less a figure than Gene Amdahl to his board of directors. Grid Systems has \$2½ million backing from New York bank Citicorp.

The company still has only eight staff but they include established brains from Xerox, Apple and Computer Sciences.

Due to be unveiled in nine months' time, the office system is intended specifically for managerial use but expatriate Englishman Eilenby is cagey about what it will comprise.

He has been influenced considerably both to a positive and negative sense by his years at PARC. Big companies like Xerox and IBM are ill-equipped to take advantage of VLSI because of business decision-making difficulties, he claims.

Eilenby says that cost-justifying the huge commitments and risks involved if a large company wants to move this way is just not possible.

He considers that it is impractical to get all the different divisions to agree on features and currently elaborate market research procedures tend to reduce the size of the apparent market because of fragmentation.

Eilenby points out that informal use of office equipment is far more important than formal applications. Son, taking the example of the Xerox copier.

All the companies offering "integrated office systems" at present are minicomputer suppliers, promising an interesting comparison when Eilenby's version appears on the market.

Doubts on ICL chances of survival

ICL is less likely to survive in the information technology industry of the future than the two other European-based mainframe manufacturers, Siemens and CII-Honeywell Bull.

This was one of the predictions made by consultant Phil Dorn in a paper on the future structure of the industry presented at last week's Infotech State of the Art Review in London.

Dorn outlined a profile of the model company with all the characteristics for survival, putting a strong emphasis on communications and office technology capability.

According to Dorn, its activities should include supplying both voice and data communications kit and the operation of unregulated network services.

There should also be a research division specialising in advanced communications methods. Image technology expertise and the

supply of shared logic word processors are key factors in the office systems area.

Dorn also saw State support for R&D and a protected home market as important prerequisites for survival, thereby eliminating the UK as the base for a computer company assured of survival.

While Siemens and CII-HB were ranked by Dorn as "sure bets" to survive, ICL was given only a "fair" chance.

Apart from IBM the "sure bet" group also includes the Japanese leaders, Fujitsu, Hitachi and NEC, and three organisations strongest at the moment in the communications and office fields - Xerox, Northern Telecom and the US telecom giant, AT&T.

Size is seen by Dorn as another critical factor, which is why he saw relatively small companies like Wang, Datapoint, Prime and Nixdorf as having problems, despite their effectiveness.

IBM goes into Expert Systems

IBM is getting into Expert Systems, with a joint research project with Artificial Intelligence researchers at Stanford University who are working on a system to diagnose faults in computers.

Announcing this at Infotech's Review, Edward Feigenbaum, of Stanford, suggested that one of the highest potential application areas for Expert Systems was in making up for acute shortages in electronic technicians.

Expert Systems are those which provide advice on incompletely understood areas of knowledge, based on rules fed in by human experts.

Some spectacular successes have been made by Expert Systems recently, he said, specifically in solving problems of diagnosis in internal medicine and molecular genetics.

The Internist medical diagnostic program had been successful in solving a large set of theoretical problems including one in renal

cancer that, it was felt, only one in 10,000 general physicians would be able to answer. The problem included plenty of misleading symptoms.

A genetics engineering firm in San Francisco, Genentec, was using his Molgen program intensively in research to produce the anti-cancer drug Interferon. Feigenbaum said, adding that he has set up his own firm to market the software commercially.

The project with IBM involves a 4331 connected locally to a System 1 mini and remotely to a 370/158. It is system failures rather than chip failures that are being traced, usually to faults in communications links or operating system software.

Looking to the future, Feigenbaum saw Expert Systems being used to solve the problems of VLSI design, where the combinatorial problems were far too great either for human beings or conventional computing. He is already exploring this area in conjunction with Xerox PARC and Fairchild.

The biggest single market, however, is in the home, Feigenbaum feels, seeing Expert Systems used in games and also in giving advice on problems such as care of plants and how to joust.

One area of expertise in which Feigenbaum has been totally unsuccessful in recruiting human experts to co-operate is that of economics and management. His colleagues in these fields at Stanford are quite candid in telling him, he says, that no-one really understands the problems. These areas are still "Black Magic".

Hardware aspects

GORDON Bell, vice-president of Engineering Development at DEC, concentrated naturally on "state of the art" hardware aspects in his introduction. A fifth-generation computer can be fabricated on a Very Large Scale Integrated circuit.

Bell predicted that lower cost and increased use would displace computers in a manner analogous to the ubiquitous fractional horsepower motor.

He saw distributed processing, connecting up all these dispersed computers, as the key to the industry's development over the next decade.



FEENEY: "MIS a laudable aim which has been achieved by very few companies."



DONALDSON: "Many management clinging to technical fascination of large machines."



BELL: "A fifth-generation computer can be fabricated on a Very Large Scale Integrated Circuit."

Merchant banker predicts files - but no clerks

HILL Samuel merchant bank director Hanish Donaldson defined his systems objective as dispensing with clerical staff in the business.

By following the rules developed at Hill Samuel, a series of guidelines had been established in relation to file handling.

Files should be held close to the sections responsible for accuracy, requiring fastest response, point of origin and where they are used most frequently.

Working under those guidelines and predicting a sharp fall in processor costs, Donaldson observed that future development should help "to consider realistically a processor per application per location."

He foresaw resistance from "many management services departments who are clinging to the technical fascination of large machines and host-centred networks."

Looking to the next ten years, Donaldson felt it infeasible to develop a cost-effective programming language based on natural English.

Users will be discouraged from developing their own application software, particularly in relation to file maintenance and accounting.

There was strong audience reaction to implied criticism of the database approach inherent in Donaldson's paper - questions from the floor showed a particularly sharp reaction from software and hardware representatives noticeably removed from the user front end, which was Donaldson's hobby horse in the paper.

Hoskyns Group managing director Jim Feeney concentrated in his paper on the apparent failure of the Management Information System approach which seemed so promising ten years ago.

Feeney described MIS as "a now largely discredited term for a laudable aim which has been achieved by very few companies. The irrelevance of the results and, in many cases, the sheer destruc-

tiveness of the programmes undertaken in pursuit of MIS have led to its general abandonment as a goal for the industry."

He blamed a variety of causes for the failure, including data management, some main files became one master file, transactions accumulated a multiplicity of sort keys, run times for productive work doubled or more, and a number of companies went bankrupt during this phase.

Programmers were seen as the enemies of progress by MIS practitioners - in some ways correctly - since programming was and remains the bottleneck.

Feeney demonstrated the contradiction between the constantly-rising performance claims from hardware manufacturers during this period and corresponding failure of the systems to deliver end-user benefits on the scale expected.

Summarising his points, Feeney saw the way forward to lie via distributed processing.

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BRUSSELS, May 5-7, 1981

Europe's leading showcase for minicomputers, peripherals, terminals and microprocessors attracted nearly 6,500 trade buyers to the 1980 event. Visitors came from 15 countries worldwide with the majority consisting of directors, managers, data processing managers, systems managers, systems analysts, programmers, technicians, buyers, engineers and consultants.

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Benefits

Manufacturers would seize on the creation of excellence centres if only to make use of them as potential customer reference installations. Whether the DP management teams involved would show the same levels of enthusiasm in face of mass invasion and "notoriety" is far from certain.

This might be countered if the award carried substantial benefits, such as unlimited speaking engagements at all On-Line Conferences in venues like Hawaii, Brazil or Mexico, or granted honorary membership of the BCS, BHM, NCC, and the IBM user group.

Before seals of excellence are awarded, some guidelines must be established. Even the BBC finds difficulty in developing an acceptable system of monitoring success in terms of research and study output. The Commission has established a "think tank" known as FAST (Future Assessment and Study Team) in the field of Science and Technology led by six Commu-

nity scientists from various disciplines.

There should be no shortage of DP think tanks, as most managers have six team members whom they would prefer to have cluttering up an ideas forum rather than the installation.

Siting of think tanks should prove no problem. Given the academic bias, obvious locations are the Hatfield Poly campus, Immos in Bristol, or Nexos in Centre Point.

Selection

First item on the forum's agenda will be to establish selection criteria. Selecting Centres of Excellence will need more than a letter of recommendation from equipment suppliers or the company managing director. Nominations will have to come from independent sources, with a heavy leaning on fellow DFMs, consultants - and possibly computer journal editors.

Methodology established, the next stage must involve deciding specifications. Should the Centres of Excellence include small-scale minicomputer installations operating with minimal resources, a critical real time distribution warehouse system, or large multi-mixed configurations operating on three-shift seven-day week routines? Perhaps cost/performance criteria should be the determinant, or output measured in terms of available resources?

The end user should have a strong say in the selection process, as should the privacy group of the National Council of Civil Liberties.

These awards may stimulate the computer industry, especially if Centres of Excellence are indicated in the Computer Users' Year Book with a star or rosette. As computing is much involved in tabulation and data processing, the DP Centres of Excellence scheme may have a promising future.



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Fierce attack on sales ethics

A FIERCE attack on the attitudes of management in big computer companies and on the techniques of computer salesmen was made last week by Brian O'Heron, former systems and technical support chief at ICL.

Speaking at the Infoterm 80 at the Ari Review in London O'Heron deliberately avoided the subject he was billed to discuss, the problems of achieving user oriented systems. Instead he chose to highlight what he considered to be the real reasons that users so often end up with systems that fail to meet their original requirements.

O'Heron asserted that the main concern of computer salesmen was to hide the truth about their product rather than inform the customer. He singled out high commission related quotas resulting from the rapid growth of the computer industry as the force driving them to make a quick sale regardless of user satisfaction.

According to O'Heron, the only way this rapid growth could be

slowed down was for customers to refuse when subjected to sales pressures, even if a negative response proved more difficult than agreeing to buy.

Turning his attention to managerial attitudes, O'Heron said that directors of large firms were too occupied with company politics to worry about customers or the work of those below them in the organisation.

O'Heron told how he had been prevented, during his executive days in a large company, from motivating fully the people for whom he had responsibility.

Illustrating his argument about company politics, O'Heron described how a group of ICL managers tried to "kill" a project to manufacture a particular design of printer because they had favoured another design that had been rejected earlier.

O'Heron directed the ICL 2900 development programme from 1970 onwards but returned to his native US as president of Grundy Terminals of San Diego.

OCR equipment for Paris Gendarmerie

OPTICAL character recognition equipment has been installed at the Paris headquarters of the French Gendarmerie, a branch of the military which covers a range of activities from the territorial army and military police to the consular and rural police force.

Consisting of two OCR Scandata 2250/1 scanning systems based on 28K word Digital Equipment PDP-8E processors, with two Perotec magnetic tape units and four Scanplex 1 VDU's, the equipment replaces two Scandata 250 systems installed in 1973. It is used to process an average of 15,000 documents a day such as arrest reports and duty logs typed by individual gendarmes on patrol, as well as pencil and paper tests completed by job applicants.

The £155,000 basic 2250 scanning system reads OCR-A and OCR-B type fonts and the simple pencil marks used on the test papers. Enhancements allow other type fonts and handprint, either numeric or alphanumeric, to be used and the system can also be configured for key-to-disc or key-to-tape data entry.

Documents with unidentified characters are stacked separately and the bad characters can be corrected from a £9,250 Scanplex 1 VDU, which displays the character as it appears to the scanner. If it

is not clear enough to be identified, the original can be consulted.

The Gendarmerie finds that about one-fifth of the documents read in are rejected, but usually with only one bad character, which means that between five and ten characters per 1,000 have to be rekeyed. This is thought to be acceptable for non-professional typists and is expected to be a more economical method of input than current alternatives, such as a key-to-disc unit for each of the 4,000 brigade offices or a network of terminals.

EEC study of viewdata in farming

A STUDY on how a viewdata database could best serve the European agricultural community is to be carried out by Argonne International with IPC Agricultural Press and Misset, the specialist publishing subsidiary of Holland's biggest publisher, Elsevier.

Funded by the EEC under a £30,000 contract as part of its plan to stimulate the creation of public databases in Europe, the study is intended to confirm the requirement for information, determine the costs of a Community-wide network and produce an initial design for a system, attempting to resolve the problems of the different optional coding standards used to viewdata and the different languages spoken.

'UK first' claim

PROTOCOL converters aimed at PSS users have been launched in the UK by Noltan Communications of Chesham, Bucks, which claims to be the only UK supplier whose converters have passed British Telecom's X25 test procedures for both PSS and Euronet.

BRIAN O'HERON (right) launched a fierce attack on both managerial attitudes and sales techniques at Infoterm 80.



Cheaper by package

SOFTWARE packages are cheaper than home-grown systems and help to break the programmer bottleneck, according to James P. Forster, vice-president of the National Shareholders Association Symposium in Minneapolis.

He quoted a program costing five times more to develop in-house than to purchase as a standard package. "It would take 16 months to develop and implement, as opposed to six months for the package."

Speaking of revenues from each product, he forecast that by 1985 packages would be earning \$8 billion a year, almost twice as much as custom products at that time.

"Users are beginning to see the benefits of using available and standardised packages where the development costs are spread over a larger base and personal costs can be held more constant."

"Today more than half a million people are classified as programmers."

"As demand for these people is growing at 20 per cent a year, until the shortage eases, the range of standard packages available should be seriously considered."

Companies with non-standard needs would find implementation systems could help produce applications software more quickly.

DEC cuts its word processor price

DIGITAL EQUIPMENT has substantially reduced the price of its stand-alone word processor and improved the software to an effort to become "a major force in the European word processing market," in the words of European WP manager Ray Redpath.

The Word Station now costs £4,995 for a single screen, twin floppy discs, and daisy wheel printer. Software for list processing and communications is included in the price, and for another £495 a package called COS-310 turns the machine into a small business system providing basic and Fortran programming.

The Word Station is a development of the existing WS78 stand-alone machine, using basically the same hardware but with

improvements to that and the software to increase speed. An "edit station," without a printer, can be bought for £3,515 for preparation of documents that can be sent by the communications link to another unit for printing.

Six satellites on order

SIX satellites worth \$180 million are to be ordered by Icomsat, the international maritime satellite organisation, from the European Space Agency, Intelsat and Comsat in the US under seven-year contracts totalling \$8.5 million.

Traffic to be carried includes telefax, facsimile and a variety of data speeds, as well as telephone and priority distress signals. Shipboard terminals in use with Comsat's current Marisat satellite network now total 500, but this is expected to grow to 2,000 by 1985 and 5,000 by 1990, or more if costs fall much from the current levels of \$40,000 to \$70,000.

South Africa expands

BOOSTED by the threat of sanctions, the electronics industry in South Africa is expanding and will be able to manufacture medium sized mainframes within two years.

This is the opinion of Abie Van der Berg, chairman of South Africa's Industrial Development Council.

Open University puts 'remote blackboard' under student test

THE Open University will evaluate student response to the 'remote blackboard' facility of its Cyclops teaching terminal system under a two-year study contract with British Telecom.

The blackboard allows users to write or draw on the Cyclops screen or on an attached graphics tablet to a similar way to the Telewriting device developed by the French research centre CCETT for the French government's telematique programme.

Evaluation is being helped by Argon International, which assisted in developing the Cyclops terminal and is marketing the product internationally.

For trial purposes, a tutor will be linked to groups of students by

a conference telephone call. Each participant will be able to address another and draw on all the screens. Pre-recorded cassettes can also be used.

Cyclops is designed to display colour graphics to a resolution of 320 by 240 picture points, although monochrome will be used in the trial.

It is also compatible with Preset and Argon's IVS-3 viewdata systems for displaying alphanumeric characters and mosaic graphics.

With two additional character sets and a geometric graphic coding scheme like the Canadian Telen system, Cyclops also has a run-length encoded graphics mode for reproducing photographic images like Picture Preset.

AT&T joins list of survey 'pioneers'

AMERICAN telecommunications giant AT&T is among the first subscribers to a UK residential market study for teletext and viewdata being conducted by London-based consultancy Communications Studies and Planning.

Eastern Counties Newspapers is another initial study subscriber and is collaborating with CS&P by providing information on use of its Prestel database.

Individual subscription fees are £5,000, or £18,000 on a group basis, allowing reproduction within an association. Four or five more subscribers are needed to make the project break even.

Based on users' diaries and interviews conducted with them, the first report in the three-stage study deals with teletext reactions. It is due for completion before the end of the year.

For viewdata reactions, CS&P is waiting until 400 genuine residential users are registered on Prestel. Most of those now registered as residential are new viewdata industry members with additional home terminals.

Market researchers are confident of achieving their 400 target in time for the study to be completed in March with the third and final report an analysis of findings.

AES and Wordplex split up

THE marriage between two of the world's principal suppliers of word processors, both Canadian owned, is over. AES and Wordplex are being split apart by their parent company, the Canada Development Corp, only two years after they were bought up entirely and merged (CW, August 3, 1980).

AES will continue to operate from Canada but control of Wordplex will be transferred to London where Harry Mallinson, managing director of Wordplex in the UK before the merger, is to become international president. Wordplex sales offices are to be opened in the US in an effort to improve the company's hitherto poor penetration there. The former distributors, Lanier, have been co-opted into selling AES machines.

Jerry Billee, vice-president of the Canada Development Corp, said that the split was intended to "increase the market penetration" of both companies. It was originally thought that the two product lines were compatible, but difficulties in trying to sell both with the same sales force led to the marketing forces being split, and a total separation has been predicted for some time (CW, July 10).

Growing market

THE UK small business systems market will increase several times over in the next five years, according to a survey from May Report, an EEC publication. The total value of systems sold will rise from £22,000 million in 1975 to £100 million in 1985.

SOFTWARE FILE

Crash course in pitfalls from ICL

If you haven't time to study economics or accounting, a morning spent at Balance the Alternatives, ICL Datasilk's financial planning service, might prove a valuable substitute.

Datasilk appears at "Alternatives" in the guise of business consultant as well as in the more familiar role of ICL software house. Its successful financial modelling package Prosper is the tool in a wide-ranging examination of the financial roundabout and swings which can make or break a company.

Financial and modelling packages have provided boom sales for the software industry in the past year, partly as a consequence of the recession which has forced companies to examine their use of financial resources more critically than ever before.

The pitfall in using such a tool is the one inherent in the use of all statistics — one has to know the right questions to ask in order to get a realistic and helpful response from the system.

Balance the Alternatives is a crash course in pitfalls — how to identify them and how to put avoiding action into effect.

Independent consultant Geoff Smith demonstrates the importance of keeping a balance between the various elements of cash flow: money used and cash required, liquidity and productivity, sales,



SMITH... some says opening figures.

prices, volume of business, costs and profits, pay increases and employee relations.

His theories are then put to the test using Prosper, which generates business plans linking those key factors, and shows in stark detail how gaining money on the rounds leads to such losses on the playground goes out of business.

Repercussions

Prosper allows a detailed study of the effects which stem from such actions as putting up prices or cutting the workforce, with all the repercussions on income, profit, and productivity, clearly shown through comparative columns of figures.

Concentrating on "added value" and the profit per £ of capital, Smith uses the concept of balance between the ratios to extrapolate some eye-opening figures from the published accounts of (unnamed) major companies.

A manager trying to put his own business on an even keel, or discover the reason for a competitor's success, could do so on a terminal in the privacy of his office, without privileged information. The system is easy to master, and a business plan can be produced in half an hour using only the published reports, once the various ratios of profit and loss are understood.

Helping builders to give accurate estimates

CONSTRUCTION firms throughout Europe are being wooed by Estimation Ltd with a system that aims to give users an accurate quotation of job costs without involving them in programming and file maintenance. It was developed in the US by Estimation, Inc. to speed what is often the builder's most laborious job, estimating, and is said by managing director David Summerfield to cut the time spent on this activity by 75%.

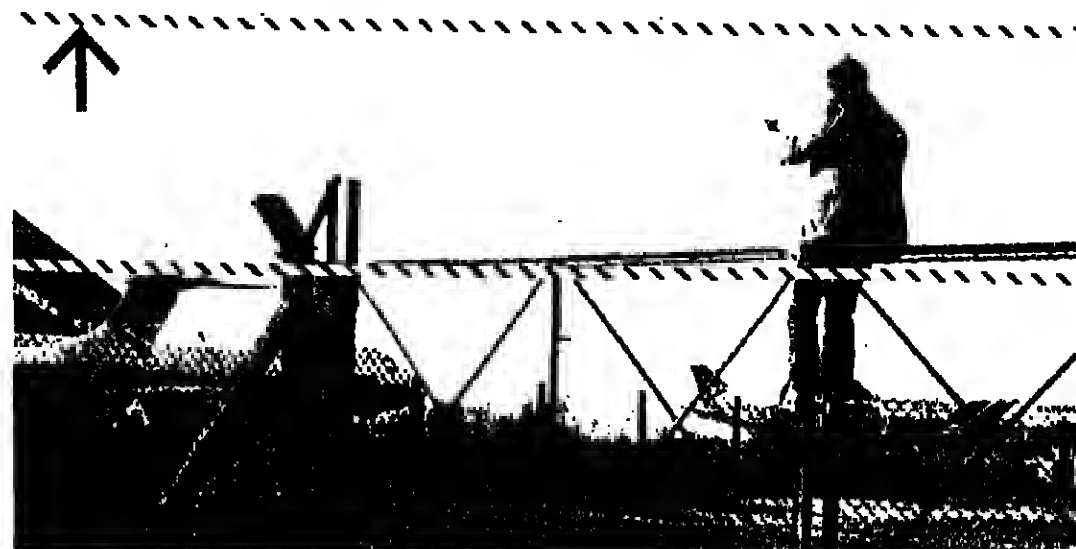
The British company was set up in Solihull nine months ago to take the US system and put it on the European market. Essentially, it prices labour and materials.

The system runs on an LS2000 which was specially built for the application, is based on two 280 chips and runs under CP/M. There are three standard systems: present, for electrical, mechanical and ducting work. Development manager Chris Wall said the system was designed to prompt the user at all the time. There are about 30 programs for each system and they are all written in BASIC-2.

Zeus City order

SOFTWARE house Zeus Hermes has won the biggest contract in its 11-year history. The contract is for enhancements to the Foreign Exchange in-branch system for National Westminster's London-based World Money Centre, and is worth over £500,000. The system will provide dealers with up-to-date exchange rate information and will facilitate calculations affected by their constant fluctuations. Scheduled to go live in 1982 on dual General Automation 16470s, the system will draw on Zeus-Hermes' specialist experience in real time banking applications.

by Claire Gooding



MICRO software specialist Southdata is launching a vision system aimed at solving security problems. Vision-80 is a package consisting of one or two hardware boards and a set of programs carrying out processing on a standard industrial TV camera picture.

The system looks for movement in the picture, classifying the moving object by size, speed and direction. It falls into a pre-defined "sensitive" category, the movement is reported and appropriate action taken.

This might involve setting off an alarm if the system is used as a security watchdog or incrementing a counter if it is being used to monitor queues.

As false alarms are the great plague of automatic security systems, the software deals with an exact definition of "illegal" movements. Exceptions are entered by parameter enabling anything smaller/larger, shorter/taller, wider/narrower than the object defined to be ignored.

Criticism can also be set for the exact area of movement, speed and direction.

The system could operate a traffic census by registering the number of vehicles larger than a given size and moving at a particular speed on any piece of road.

In the picture, Vision-80 would ignore the area outside striped lines, and anything such as clouds or birds moving within them, but the man carrying the gun would set off an alarm since, reduced to a two-dimensional pattern, he would enter the pre-set "illegal object" category.

The prototype is a standard Z80 micro running under CP/M using about 8K bytes of RAM.

The IBM display for non-IBM computers.

IBM have just produced a new VDU that will connect to most computers. Because it's ASCII Teletype compatible.

The first thing you'll note about it is the startlingly crisp definition of its screen.

It should also please everyone using the VDU, because the screen tilts and swivels for comfortable viewing.

There are dished keys for fast touch-typing; in fact the excellence of the whole keyboard design is a direct result of IBM's type-writer skills.

Not only is the terminal easy to use—but it's easy to set up. Less than 30 minutes from unpacking to running.

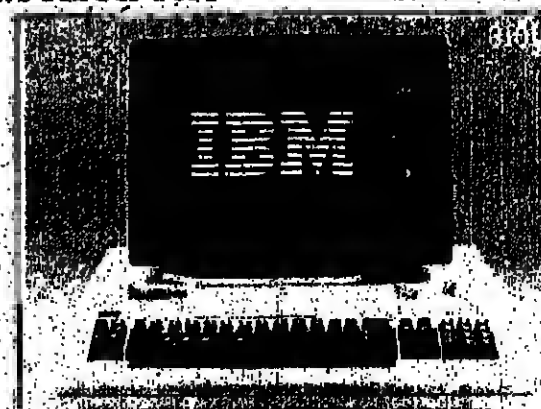
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TEXAS

£1 million compensation report 'storm in a teacup'

REPORTS that ICL paid Oxford University over £1 million to compensate for its 2980 system 'failures' have been described by the company as "rubbish" and as "a storm in a teacup" by Oxford University's Computing Service department.

The first report appeared in the Oxford Mail on November 25 and was picked up by The Times and Daily Telegraph a day later.

ICL has admitted that the Oxford contract was renegotiated in the summer of 1978, a year after the 2980 was installed.

Extra items

Oxford University said that ICL had supplied some extra hardware, including disc stores and memory and some "extra items" of software. These additions amounted to far less than £1 million, according to the University.

The Department of Education

and Science's Computer Board, which hands out money for university computer equipment, was unable to comment on the affair.

Computer Weekly reported in April 1978 how Kommy software problems on the 2980's 79056 communications processor had been sorted out with patches.

This enabled government acceptance tests to be passed in time for the Computer Board to make main payment on the machine before the financial year ended and funding evaporated (CW, April 13, 1978).

This left 20% of the total payment outstanding, conditional upon the system's passing the fourth and final stage of benchmark tests stipulating doubled performance compared to stage three.

Both the University and ICL refused to provide details of the renegotiation. According to the University, the 2980 was signed off finally a year ago.

'A Laker needed to break PO monopoly'

FRUSTRATION was in evidence at the annual conference of the Telecommunications Managers' Association, held last week in Coventry.

Keynote speaker J. E. Sampson, director of telecommunications at Standard Telephones and Cables, called for a full-scale easing of the British Telecom monopoly.

The proposed government solution, of leaving the policy decisions to the Minister of State, was more of a political ploy than a practical solution, said Sampson.

"It is in fact", he said, "a travesty of what liberalisation should be. The industry badly needs a Laker who in the guise of TeleLaker could cut through the Post Office monopoly."

In reply Jobo Harper, deputy managing director (operations) British Telecom, said the Post Office recognised that liberalisation had to happen, but there were many differing solutions. The collective interests of the user, however, must at all times be the responsibility of the PTs; it was the government and not the Post Office which made the rules.



BUTLER... "Power to license alternative network systems."

Involve private sector - Minister

A GOVERNMENT Minister told the Telecommunications Managers' Association in Coventry last week that the resources of the private sector must be fully mobilised to create and use the opportunities that new technology gave.

The Minister of State for Industry, Adam Butler, said the government's new Post Office Bill was designed to make the telecoms industry more efficient.

The Bill, if passed, would split the Post Office into separate postal and telecoms corporations and would make it easier for private kit to be connected to

British Telecom equipment.

Butler said: "The Bill would give the Secretary of State the power to license alternative network systems, and we are anxious that private manufacturers should be given every encouragement to make use of this new 'information agreement'."

"The government will continue to give selective financial support and we shall seek to establish favourable trading opportunities for our manufacturers."

Butler suggested that industry needed to familiarise the next

generation of workers with data processing, and this should start at junior school level.

He also paid tribute to some of the UK's achievements in telecoms, which he said put it ahead of most of Europe. These were:

1. 100,000 telex sets in use - the highest number in the world;
2. Over 1,500 micros in use in secondary schools;
3. 6,000 Prestel sets in use;
4. ICL's CAPS, which he said was a world leader;
5. Fibre optics.

Transport costs cut 10% claim

A REAL time system for transport distribution managers has been introduced in the UK by Freight Computer Services, bureau of the National Freight Company.

Called DiPS and developed originally by Vaughan Reid, an independent consultant formerly with BOC Datastore, the company claims that its system cuts transport costs by at least 10%.

DiPS runs on Freight Computer Services' dual Honeywell Level 66 in Birmingham under its nationwide time-sharing network, FCS Time. It took the company just three weeks to make the system "user friendly" with a minimum of work required.

For an initial £1,000-£2,000 outlay, including hardware terminal and cabling on the number of lorries, the user has 24 hours a day service from Monday to Saturday inclusive.

The package is based on a number of programs covering the whole distribution activity range, including account clustering, road network analysis, warehouse and depot location, plus strategic and daily operations involving delivery route planning.

DiPS' strategic distribution planning program is described as a total package designed to maximise the transport department's resources.

It considers relevant factors like changes in drivers' hours, effects of proposed legislation, interaction of several depot areas and evaluating fleet mix.

The system complies with EEC changes in driving regulations, under which there is an eight-hour limit on drivers' working days from January 1, 1981.

Daily route planning modules come into their own in bad weather conditions and in the event of vehicle failures, driver absence, road closures and other short-term distribution problems.

The package is also available to run on the customer's system. Users doing so already include Butmah Castrol and Dorchester-based brewery Eldridge Pope.

MICRO NEWS

Good gate at first show but its 'quality' varied

The Which Computer Show opened for the first time at the National Exhibition Centre in Birmingham last week, with a good initial first-day attendance of 4,300. Requested tickets before the show had totalled 24,000.

Over 150 stands just filled the

new Hall 7 at the NEC, which coped successfully with the visitors and exhibitors in all ways (bar their eating habits). The number of visitors was high - though their quality could be described as patchy, with a definite proportion of school-children.

A few companies such as Rair and Sharp, which clearly fitted into the category of dealing in small business-oriented systems, were conspicuous by their absence. Their reasons could perhaps stem from the attitude of not wanting to exhibit at a first-time exhibition.



On display at the Which Computer Show was the 765 bubble memory terminal, particularly suited to applications requiring portable stored data.

FEW new launches were planned to coincide with the exhibition, and one that was not quite made it in time. Nascom International, the new company recently formed from the assets of the old Nascom by Peter Matthews, had hoped to release its first new product, but owing to "lack of time" they did not appear, and can now be expected towards the end of the year.

Ironically, there were still no Apple III systems in dealers' hands, although one could be seen on the Microsense stand. At the moment it seems that Apple in the US is putting more effort into going public than into producing Apple IIIs.

One new launch that was not looking too popular at the show was CIS-Cobol, offered by Cinsal Computers of Norwich for use with Texas Instruments' Models 1 to 10 business systems.

Cinsal completed the deal with MicroFocus only a few weeks ago, and was using the show as a test market. The CIS-Cobol is available for £450 plus an additional £100 for the Forms-2 screen formatter and program generator.

One of the reasons for the low

interest was thought by Edgar Blazier, managing director of Cinsal, to be the need for a UCSD Pascal operating system. CIS-Cobol is only portable with Pascal and thus a Pascal compiler is needed.

However, the University College of San Diego (UCSD), does not supply its Pascal in one-off quantities. An initial outlay of a few thousand pounds is needed for 25 copies and then each copy can be obtained for a few pounds.

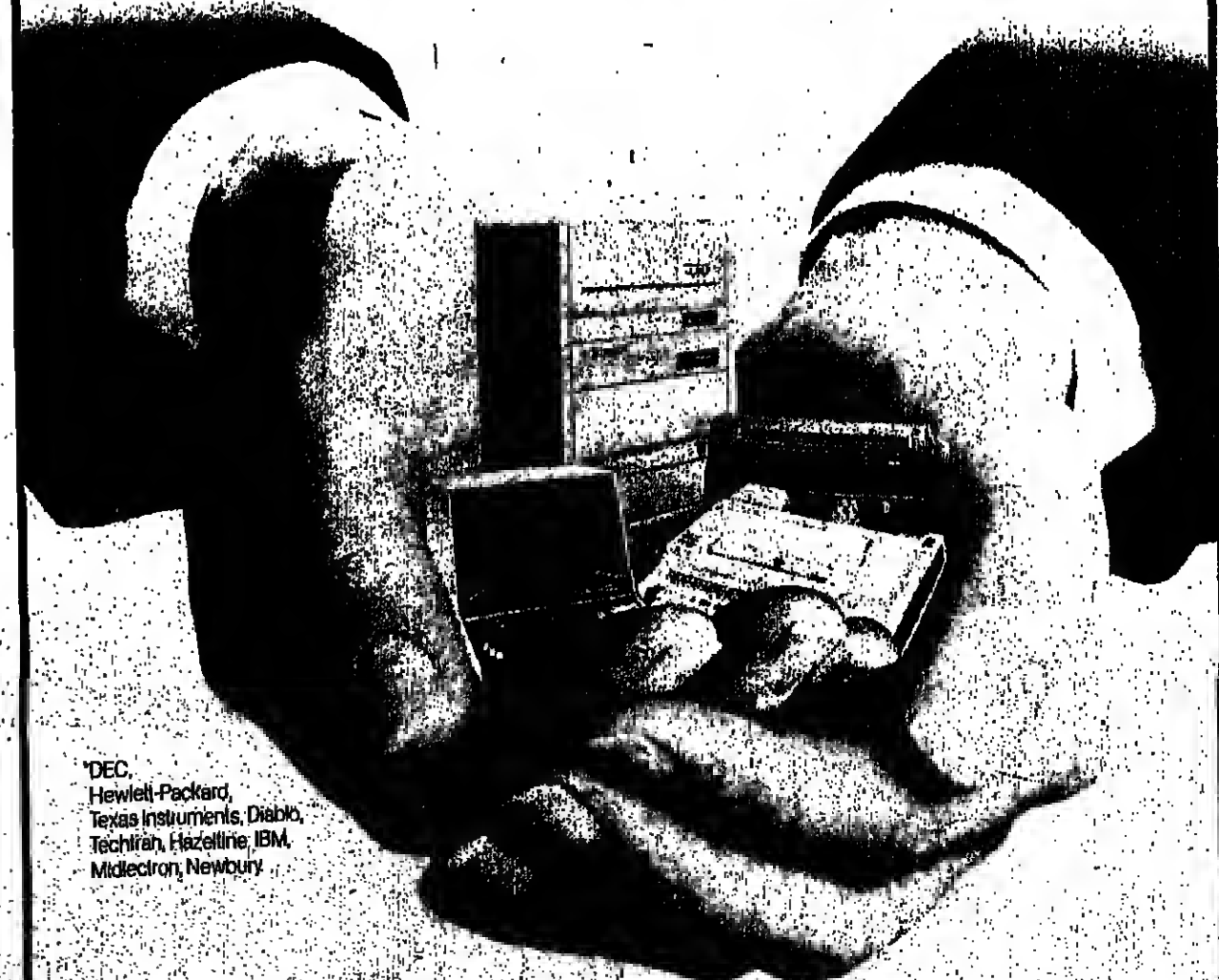
Cinsal will be using CIS-Cobol in-house for program conversions, but is not necessarily committed to marketing it on a large-scale basis.

Tandy went to town on its stand with a full classroom-type do-it-yourself demonstration. Anyone could sit at one of the 15 or so Model 11s and have a go at operating it. Also on the stand, for looking at only, were the recently introduced pocket computers manufactured for Tandy by Sharp in Japan.

Commodore had a crowded stand, though it was not as large as usual. It probably took the spill of visitors normally scattered round the dealers' stands. There were few Pet or Apple dealers at the show.

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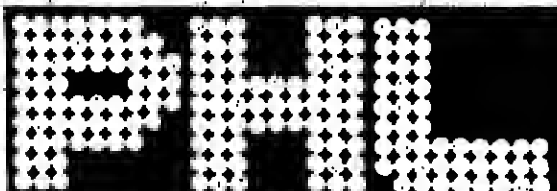
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30 cps dot matrix terminal. Full back paper advance from 3-14 inches. EIA interface. 4 adjustable character widths. Full 80 ASCII character set. 7 x 9 dot matrix. Options include a 20mA interface, tractors to accept microdot feed paper and numeric keypad.
from only **£695**

DIGITAL LA120
120 cps keyboard terminal. Substantially reduced pricing. 120 cps dot matrix. EIA interface. Full 80 ASCII character set. 7 x 9 dot matrix. Options include variable tractor, paper, 20mA interface, numeric keypad, 800 baud. Full forms handling facilities. Options include microdot feed paper, 20mA character set and numeric keypad.
from only **£1658**

LEAR SIEGLER ADM-3A
The most popular visual display terminal. 120 cps dot matrix. 120 character screen capacity. Cursor addressing. Dual keyboard. Auxiliary port. Wide range of speed and word processing. Includes numeric keypad, 20mA character set and numeric keypad.
from only **£545**

GRAPHICS TERMINAL
Low cost terminal with 2400 baud. Comprehensive screen gives the ADM-3A microprocessor and RAM sufficient for a 128 x 256 dot grid and variable scaling from 1024 x 768 variable pixel plotting. Vector drawing and alphanumeric character display.
from only **£1295**

LEAR SIEGLER ADM-31
Low cost VDU with two page display and full editing features. Dual interface, 80-9600 baud data rates. User's lower case character set. Cursor addressing, editing, protected fields, dual intensity. Optional polling and addressing, printer port.
from only **£795**

LEAR SIEGLER ADM-42
Dual intensity VDU with up to 12 pages of display. Full editing features, cursor addressing, editing, protected fields, dual intensity, alternate function keys, status display. Optional alternative character set, programmable function keys, synchronous interface, line drawing set.
from only **£1049**

TYPEWRITER TERMINAL
Two machines for the price of one. Typewriter style keyboard for single documents, letters etc. Pin feed for continuous business documents. Electric typewriter keyboard layout and touch. Left and right hand margin setting. Crisp, high quality printout.
from only **£799**

TECHTRAN 980
Mass data storage, high speed retrieval and intelligent data collection. Micro-processor control. 200K character storage per document. 8000 characters. Switch selectable speeds. Easy file oriented mass data storage. The 980, with a powerful disc editor, high speed search and editing.
from only **£995**

TEXAS 810
Compact 120 cps 120 column printer. 8000 characters per line. 120 columns. 8 x 7 dot matrix. 80 ASCII set. 9 x 7 font. 24 pin serial interface. Forms control options. 20mA character set and numeric keypad. Corrupted print option.
from only **£1275**

TELETYPE 43
Versatile, economic and reliable; 30 cps, serial interface keyboard printer. 132 or 80 columns. 94 ASCII set, 9 x 7 font. Crisp, high quality printout. Microprocessor controlled. Portable versions. Character set options. Call today for more details or a demonstration.
3 Month Offer from only **£625**

T1745
Portable 30 cps terminal including keyboard, 20mA character set, numeric keypad, 80 columns print line, 120 columns. 8 x 7 dot matrix. 80 ASCII set. 9 x 7 font. 24 pin serial interface. Forms control options. 20mA character set and numeric keypad. Corrupted print option.
from only **£1250**

COMPANY NEWS

Market worried by ICL portents

ICL shares are languishing at their lowest level this year, at 109p. They have plummeted to this level not through the general economic climate, but because of real and growing share market uncertainty about what ICL's 1979-80 profits will be.

Stockbrokers Wood Mackenzie's ICL watcher Graham Meek revised his forecast of company profit downward last month from £49 million to £42.5 million. Since then ICL has announced closure of its Winsford (Cheshire) plant, with 2,500 redundancies.

Depending on the accounting treatment ICL gives to these items, and remembering that closing down the plant will fall within this year's accounts, market rumours have hinted at the half-year figure of £20 million as the profits for 1979-80.

Like all Stock Exchange rumours, they represent an amalgam of deduction and emotion, the emotional aspects deriving from the poor results from other British companies. Courtbaile has produced half-year profits of £2.8 million against £30.2 million for the corresponding period of last year.

The deductive element derives from an almost unbroken series of redundancies and closures which began with ICL's rejection of its 1980 graduate intake.

ICL has made few recent significant product announcements, and will miss the order book stimulus that such announcements provide.

Almost alone of ICL's current products, the ME29 is maintaining sales ahead of estimates, the company claims.

This is obviously insufficient to convince a nervous market that ICL shares are a good buy.

Last year Amal had suffered disastrously and IBM badly, from customers switching to renting or leasing rather than outright purchase.

ICL has declined as a matter of policy to reveal what its rental base is but any major switch by customers to rental or leasing from purchase could have the kind of impact on company figures that the market fears.

'Wrestling back magnetic tape business from US'

CAVENDISH King and Computer Supplies are 'trying to wrestle some of the magnetic tape market back from the American boys', in the words of technical director Peter Mowland.

The company has bought plant machinery and technical staff of Raci Zani's computer magnetic tape division and has formed a new subsidiary, Euromagnetic Products Ltd (EMP).

Mowland says that EMP has already won a number of products and will appoint distributors throughout the UK, Europe and the rest of the world.

'We are looking at the UK and Europe at the initial stage but we've had a number of inquiries from South Africa, Australia and India', he said.

Raci Zani is to supply EMP with raw materials as part of the £250,000 deal. EMP will also offer a computer magnetic tape cleaning and testing service for customers' existing tape libraries.

Mowland points out that Cavendish King is one of the few UK companies to own a 6250 BPI certifier.

H-P shatters records

RECORD sales, profit and order-book figures have been announced by US computer and test equipment maker Hewlett-Packard for the year just completed. Overseas orders accounted for 52% of this year's total, but have fallen for the second quarter run.

Domestic orders rose by 8% from the third to fourth quarters, while overseas orders fell by 4%. Compared to last year's fourth quarter, overseas orders were up 23% while domestic orders rose by 21%.

Data products accounted for 49% of the year's sales of \$3.1 billion, up 31% from \$2.36 billion in 1979. Over the year profits were up by a similar percentage, 32%, while this year's fourth quarter profits were up 43%.

The 1980 order growth rate was below last year's level.

Penn Central drops bid

PENN CENTRAL, the over-recovered pup of the formerly bankrupt Penn Central Railway, has dropped its \$600 million bid for GK Technologies, the Connecticut-based electronic component supplier.

Penn Central disclosed its reason for abandoning the bid as lack of sufficient information with which to evaluate the GK exposure of the liabilities of a controversial subsidiary.

The latter was responsible for some of the electrical work on the Las Vegas MGM Grand Hotel in which 83 people were killed last Friday.

Saturday 'special' quartet thrives

THE Financial Times reports on Rule 163(2) market trading only on Saturdays, which explains why not many people have the opportunity to know how the Stock Market views performance of the four principal computer companies trading on that market.

Quint Automation reported turnover up from £5.077 million to £7.501 million last year and was trading this week at 170p, 3p down from its all-time high.

Specialised commodity broker, Nantwich-based, and Nolon, which jumped to the top of Graan and Co's (stockbrokers) profitability league table last year, traded at 74p, 4p above the average for that period.

Nantwich-based stockbroker, Nantwich-based, has climbed spectacularly from a price early last year of 20p to a 38p high last week.

Nantwich has written off most of the expenditure on the two ICL 2872s acquired earlier this year and most of the recent development costs on its new broking system.

Nantwich's profits are related closely to Stock Exchange turnover and this year's volume has been high enough to anticipate maintaining at least last year's profits.

Applied Computer Techniques Ltd, the hottest computer stock trading at present, rose to 470p. The Rule 163(2) market is one in which each bargain has to be a real bargain. The company's stock has been approved and is due to be replaced by the United Securities Market late next year.

Under the USM regime, untraded trading is allowed once a company has been admitted and the field is dominated by small oil companies.

Many suffered from the Chancellor's announcement of increased North Sea taxes. Fortunately, Sir Geoffrey has not found a current way to penalise computer companies.

Receiver in at software supplier

A RECEIVER has been called in at Globe Computing, a supplier of DEC software, after a row caused the departure of one of the company's founders. Nicholas Brackenbury has left after disagreements with Richard Walde over the management of the company, part of the Lodon-based Computer Trading group.

Brackenbury says that accounting problems between Globe and the Dutch company Accord, 50% owned by Computer Trading, are at the bottom of the row. Walde says that there have been 'multiple disagreements' which have resulted in both parties consulting their solicitors. He added that the Dutch company is simply dormant but that others in the Computer Trading group are trading satisfactorily.

Brackenbury alleges that he has been fired from the board of Globe and from another Computer Trading company, Maiodeck Computer Engineering. He has also resigned from the board of Accord and the Computer Trading subsidiary Waltham Management Systems.

Globe had an order book of about £250,000 at the time the receiver was called in, according to Brackenbury, but details of its final trading position are not available.

Computer Trading has about 20 employees throughout its subsidiaries, some of which earlier shared directors and offices with Globe.

Computer Trading has about 20 employees throughout its subsidiaries, some of which earlier shared directors and offices with Globe.

Into the billions at Litton

FIRST quarter earnings at Litton Industries reached a new record level of \$61.3 million, up from \$55.57 million for the same period last year. A major contributor is

expected to be the business systems area. Turnover was also up from \$953 million in the first quarter last year, to \$1.12 billion this quarter.

value between 10-20%. In practice, average on-site life was less than three years.

According to current American estimates, residual value of a £3 million 370 installed in 1976 was less than \$300,000.

No one contacted in the UK would quote more than £150,000 for the 158, best of the 370s, even 'with all mod cons' as a salesman explained. The same source said that a 370/135 was worth nothing.

Lloyd's has made provision for the losses against the profits for the period in which the deficits occurred. During that 1977-80 period, Lloyd's has reported the second highest profit ever, despite the leasing setback.

Pet deal for CBS

MINICOMPUTER dealer CBS Consultants of Birmingham has moved into the microcomputer field by becoming a Pet commercial systems dealer for IBM. Up to now CBS has dealt with Adler, Olivetti and DEC systems.

Cray shares

CRAY RESEARCH has placed 4.5 million shares on the New York Stock Exchange. The first 100 shares purchased went to John Röllwagen, company president.

CW SHARES TABLE

Date: 1991/10/18				Index: 1864.44 Change: +6.18			
Pence		London Stock Exchange	Pence	US Stock		\$	
1860		Stock	Price Change	1860		Stock	Price Change
High	Low			High	Low		
618	230	A Comp Tech (Pac)	520 +18	2110	114	Commerz	1870
619	231	Adm Serv (Pac)	520 +18	2111	115	Control Data	1870
620	232	Bio Tech (Pac)	520 +18	2112	116	Control Data	1870
621	233	Bio Tech (Pac)	520 +18	2113	117	Control Data	1870
622	234	Bio Tech (Pac)	520 +18	2114	118	Control Data	1870
623	235	Bio Tech (Pac)	520 +18	2115	119	Control Data	1870
624	236	Bio Tech (Pac)	520 +18	2116	120	Control Data	1870
625	237	Bio Tech (Pac)	520 +18	2117	121	Control Data	1870
626	238	Bio Tech (Pac)	520 +18	2118	122	Control Data	1870
627	239	Bio Tech (Pac)	520 +18	2119	123	Control Data	1870
628	240	Bio Tech (Pac)	520 +18	2120	124	Control Data	1870
629	241	Bio Tech (Pac)	520 +18	2121	125	Control Data	1870
630	242	Bio Tech (Pac)	520 +18	2122	126	Control Data	1870
631	243	Bio Tech (Pac)	520 +18	2123	127	Control Data	1870
632	244	Bio Tech (Pac)	520 +18	2124	128	Control Data	1870
633	245	Bio Tech (Pac)	520 +18	2125	129	Control Data	1870
634	246	Bio Tech (Pac)	520 +18	2126	130	Control Data	1870
635	247	Bio Tech (Pac)	520 +18	2127	131	Control Data	1870
636	248	Bio Tech (Pac)	520 +18	2128	132	Control Data	1870
637	249	Bio Tech (Pac)	520 +18	2129	133	Control Data	1870
638	250	Bio Tech (Pac)	520 +18	2130	134	Control Data	1870
639	251	Bio Tech (Pac)	520 +18	2131	135	Control Data	1870
640	252	Bio Tech (Pac)	520 +18	2132	136	Control Data	1870
641	253	Bio Tech (Pac)	520 +18	2133	137	Control Data	1870
642	254	Bio Tech (Pac)	520 +18	2134	138	Control Data	1870
643	255	Bio Tech (Pac)	520 +18	2135	139	Control Data	1870
644	256	Bio Tech (Pac)	520 +18	2136	140	Control Data	1870
645	257	Bio Tech (Pac)	520 +18	2137	141	Control Data	1870
646	258	Bio Tech (Pac)	520 +18	2138	142	Control Data	1870
647	259	Bio Tech (Pac)	520 +18	2139	143	Control Data	1870
648	260	Bio Tech (Pac)	520 +18	2140	144	Control Data	1870
649	261	Bio Tech (Pac)	520 +18	2141	145	Control Data	1870
650	262	Bio Tech (Pac)	520 +18	2142	146	Control Data	1870
651	263	Bio Tech (Pac)	520 +18	2143	147	Control Data	1870
652	264	Bio Tech (Pac)	520 +18	2144	148	Control Data	1870
653	265	Bio Tech (Pac)	520 +18	2145	149	Control Data	1870
654	266	Bio Tech (Pac)	520 +18	2146	150	Control Data	1870
655	267	Bio Tech (Pac)	520 +18	2147	151	Control Data	1870
656	268	Bio Tech (Pac)	520 +18	2148	152	Control Data	1870
657	269	Bio Tech (Pac)	520 +18	2149	153	Control Data	1870
658	270	Bio Tech (Pac)	520 +18	2150	154	Control Data	1870
659	271	Bio Tech (Pac)	520 +18	2151	155	Control Data	1870
660	272	Bio Tech (Pac)	520 +18	2152	156	Control Data	1870
661	273	Bio Tech (Pac)	520 +18	2153	157	Control Data	1870
662	274	Bio Tech (Pac)	520 +18	2154	158	Control Data	1870
663	275	Bio Tech (Pac)	520 +18	2155	159	Control Data	1870
664	276	Bio Tech (Pac)	520 +18	2156	160	Control Data	1870
665	277	Bio Tech (Pac)	520 +18	2157	161	Control Data	1870
666	278	Bio Tech (Pac)	520 +18	2158	162	Control Data	1870
667	279	Bio Tech (Pac)	520 +18	2159	163	Control Data	1870
668	280	Bio Tech (Pac)	520 +18	2160	164	Control Data	1870
669	281	Bio Tech (Pac)	520 +18	2161	165	Control Data	1870
670	282	Bio Tech (Pac)	520 +18	2162	166	Control Data	1870
671	283	Bio Tech (Pac)	520 +18	2163	167	Control Data	1870
672	284	Bio Tech (Pac)	520 +18	2164	168	Control Data	1870
673	285	Bio Tech (Pac)	520 +18	2165	169	Control Data	1870
674	286	Bio Tech (Pac)	520 +18	2166	170	Control Data	1870
675	287	Bio Tech (Pac)	520 +18	2167	171	Control Data	1870
676	288	Bio Tech (Pac)	520 +18	2168	172	Control Data	1870
677	289	Bio Tech (Pac)	520 +18	2169	173	Control Data	1870
678	290	Bio Tech (Pac)	520 +18	2170	174	Control Data	1870
679	291	Bio Tech (Pac)	520 +18	2171	175	Control Data	1870
680	292	Bio Tech (Pac)	520 +18	2172	176	Control Data	1870
681	293	Bio Tech (Pac)	520 +18	2173	177	Control Data	1870
682	294	Bio Tech (Pac)	520 +18	2174	178	Control Data	1870
683	295	Bio Tech (Pac)	520 +18	2175	179	Control Data	1870
684	296	Bio Tech (Pac)	520 +18	2176	180	Control Data	1870
685	297	Bio Tech (Pac)	520 +18	2177	181	Control Data	1870
686	298	Bio Tech (Pac)	520 +18	2178	182	Control Data	1870
687	299	Bio Tech (Pac)	520 +18	2179	183	Control Data	1870
688	300	Bio Tech (Pac)	520 +18	2180	184	Control Data	1870
689	301	Bio Tech (Pac)	520 +18	2181	185	Control Data	1870
690	302	Bio Tech (Pac)	520 +18	2182	186	Control Data	1870
691	303	Bio Tech (Pac)	520 +18	2183	187	Control Data	1870
692	304	Bio Tech (Pac)	520 +18	2184	188	Control Data	1870
693	305	Bio Tech (Pac)	520 +18	2185	189	Control Data	1870
694	306	Bio Tech (Pac)	520 +18	2186	190	Control Data	1870
695	307	Bio Tech (Pac)	520 +18	2187	191	Control Data	1870
696	308	Bio Tech (Pac)	520 +18	2188	192	Control Data	1870
697	309	Bio Tech (Pac)	520 +18	2189	193	Control Data	1870
698	310	Bio Tech (Pac)	520 +18	2190	194	Control Data	1870
699	311	Bio Tech (Pac)	520 +18	2191	195	Control Data	1870
700	312	Bio Tech (Pac)	520 +18	2192	196	Control Data	1870
701	313	Bio Tech (Pac)	520 +18	2193	197	Control Data	1870
702	314	Bio Tech (Pac)	520 +18	2194	198	Control Data	1870
703	315	Bio Tech (Pac)	520 +18	2195	199	Control Data	1870
704	316	Bio Tech (Pac)	520 +18	2196	200	Control Data	1870
705	317	Bio Tech (Pac)	520 +18	2197	201	Control Data	1870
706	318	Bio Tech (Pac)	520 +18	2198	202	Control Data	1870
707	319	Bio Tech (Pac)	520 +18	2199	203	Control Data	1870
708	320	Bio Tech (Pac)	520 +18	2200	204	Control Data	1870
709	321	Bio Tech (Pac)	520 +18	2201	205	Control Data	1870
710	322	Bio Tech (Pac)	520 +18	2202	206	Control Data	1870
711	323	Bio Tech (Pac)	520 +18	2203	207	Control Data	1870
712	324	Bio Tech (Pac)	520 +18	2204	208	Control Data	1870
713	325	Bio Tech (Pac)	520 +18	2205	209	Control Data	1870
714	326	Bio Tech (Pac)	520 +18	2206	210	Control Data	1870
715	327	Bio Tech (Pac)	520 +18	2207	211	Control Data	1870
716	328	Bio Tech (Pac)	520 +18	2208	212	Control Data	1870
717	329	Bio Tech (Pac)	520 +18	2209	213	Control Data	1870
718	330	Bio Tech (Pac)	520 +18	2210	214	Control Data	1870
719	331	Bio Tech (Pac)	520 +18	2211	215	Control Data	1870
720	332	Bio Tech (Pac)	520 +18	2212	216	Control Data	1870
721	333	Bio Tech (Pac)	520 +18	2213	217	Control Data	1870
722	334	Bio Tech (Pac)	520 +18	2214	218	Control Data	1870
723	335	Bio Tech (Pac)	520 +18	2215	219	Control Data	1870
724	336	Bio Tech (Pac)	520 +18	2216	220	Control Data	1870
725	337	Bio Tech (Pac)	520 +18	2217	221	Control Data	1870
726	338	Bio Tech (Pac)	520 +18	2218	222	Control Data	1870
727	339	Bio Tech (Pac)	520 +18	2219	223	Control Data	1870
728	340	Bio Tech (Pac)	520 +18	2220	224	Control Data	1870
729	341	Bio Tech (Pac)	520 +18	2221	225	Control Data	1870
730	342	Bio Tech (Pac)	520 +18	2222	226	Control Data	1870
731	343	Bio Tech (Pac)	520 +18	2223	227	Control Data	1870
732	344	Bio Tech (Pac)	520 +18	2224	228	Control Data	1870
733	345	Bio Tech (Pac)	520 +18	2225	229	Control Data	1870
734	346	Bio Tech (Pac)	520 +18	2226	230	Control Data	1870
735	347	Bio Tech (Pac)	520 +18	2227	231	Control Data	1870
736	348	Bio Tech (Pac)	520 +18	2228	232	Control Data	1870
737	349	Bio Tech (Pac)	520 +18	2229	233	Control Data	1870
738	350	Bio Tech (Pac)	520 +18	2230	234	Control Data	1870
739	351	Bio Tech (Pac)	520 +18	2231	235	Control Data	1870
740	352	Bio Tech (Pac)	520 +18	2232	236	Control Data	1870
741	353	Bio Tech (Pac)	520 +18	2233	237	Control Data	1870
742	354	Bio Tech (Pac)	520 +18	2234	238	Control Data	1870
743	355	Bio Tech (Pac)	520 +18	2235	239	Control Data	1870
744	356	Bio Tech (Pac)	520 +18	2236	240	Control Data	1870
745	357	Bio Tech (Pac)	520 +18	2237	241	Control Data	1870
746	358	Bio Tech (Pac)	520 +18	2238	242	Control Data	1870
747	359	Bio Tech (Pac)	520 +18	2239	243	Control Data	1870
748	360	Bio Tech (Pac)	520 +18	2240	244	Control Data	1870
749	361	Bio Tech (Pac)	520 +18	2241	245	Control Data	1870
750	362	Bio Tech (Pac)	520 +18	2242	246	Control Data	1870
751	363	Bio Tech (Pac)	520 +18	2243	247	Control Data	1870
752	364	Bio Tech (Pac)	520 +18	2244	248	Control Data	1870
753	365	Bio Tech (Pac)	520 +18	2245	249	Control Data	1870
754	366	Bio Tech (Pac)	520 +18	2246	250	Control Data	1870
755	367	Bio Tech (Pac)	520 +18	2247	251	Control Data	1870
756	368	Bio Tech (Pac)	520 +18	2248	252	Control Data	1870
757	369	Bio Tech (Pac)	520 +18	2249	253	Control Data	1870
758	370	Bio Tech (Pac)	520 +18	2250	254	Control Data	1870
759	371	Bio Tech (Pac)	520 +18	2251	255	Control Data	1870
760	372	Bio Tech (Pac)	520 +18	2252	256	Control Data	1870
761	373	Bio Tech (Pac)	520 +18	2253	257	Control Data	1870
762	374	Bio Tech (Pac)	520 +18	2254	258	Control Data	1870
763	375	Bio Tech (Pac)	520 +18	2255	259	Control Data	1870
764	376	Bio Tech (Pac)	520 +18	2256	260	Control Data	1870
765	377	Bio Tech (Pac)	520 +18	2257	261	Control Data	1870
766	378	Bio Tech (Pac)	520 +18	2258	262	Control Data	1870
767	379	Bio Tech (Pac)	520 +18	2259	263	Control Data	1870
768	380	Bio Tech (Pac)	520 +18	2260	264	Control Data	1870
769	381	Bio Tech (Pac)	520 +18	2261	265	Control Data	1870
770	382	Bio Tech (Pac)	520 +18	2262	266	Control Data	1870
771	383	Bio Tech (Pac)	520 +18	2263	267	Control Data	1870
772	384	Bio Tech (Pac)	520 +18	2264	268	Control Data	1870
773	385	Bio Tech (Pac)	520 +18	2265	269	Control Data	1870
774	386	Bio Tech (Pac)	520 +18	2266	270	Control Data	1870
775	387	Bio Tech (Pac)	520 +18	2267	271	Control Data	1870
776	388	Bio Tech (Pac)	520 +18	2268	272	Control Data	1870
777	389	Bio Tech (Pac)	520 +18	2269	273	Control Data	1870
778	390	Bio Tech (Pac)	520 +18	2270	274	Control Data	1870
779	391	Bio Tech (Pac)	520 +18	2271	275	Control Data	1870
780	392	Bio Tech (Pac)	520 +18	2272	276	Control Data	1870
781	393	Bio Tech (Pac)	520 +18	2273	277	Control Data	1870
782	394	Bio Tech (Pac)	520 +18	2274	2		

DATA ANALYSIS

PREVIOUSLY in this series we have looked at the two major concepts of functional analysis — functions and events. A function was defined as a business task and an event was defined as the trigger which starts the function.

In this section, the concept of the function will be discussed in more depth in the context of the first phase of functional analysis — functional decomposition. A business can be viewed as a single function which can be divided (or decomposed) into a hierarchy of sets of successively lower-level functions. Thus the highest level function of a Trading Bank is likely to be Banking, and the sub-functions could be Lending, Borrowing, Customer Servicing and Money Management.

The progressive analysis of functions into more detailed functions is termed "functional decomposition". It allows the functions of a business to be described from the highest possible functional level to the most detailed level required, using a single method and format.

Functional decomposition has several purposes:

- It ensures that the analyst completely understands the business and the business activities before any design takes place.
- The results of functional decomposition are used for access path analysis (and hence database design), transaction design, program and system design, and in determining the attributes (the data) needed.

Functional decomposition is a "top down" method of analysing what a business does. The first step is therefore to determine what the highest level function of the area under study is and then proceed towards greater levels of detail.

In Figure 2, the highest level function in our simple example is that of household management, composed of the sub-functions of shopping, entertaining, washing, cleaning and so on.

The highest level function has thus been broken down into all the subordinate tasks which must be performed in order to complete it.

At the next level in our example we have broken down further the task of "Entertaining guests". In order to entertain guests, the tasks of providing dinner or providing tea are undertaken. As each function is decomposed the tasks become more and more detailed and specific. It is also possible to break down the task of "providing dinner" into more detailed tasks, such as "shopping for ingredients", "cooking", "serving", "clearing up", etc.

Diagrammatic conventions

As with entity models the results of functional analysis, including functional decomposition, are documented using diagrams and supplemented with forms which contain extra details.

In Figure 1 the diagrammatic conventions used for functional decomposition are shown. An event is represented by an arrow, a function by an oval box in which the name of the function is written.

Diagrammatic Conventions

Event

Function

Function hierarchy

Exclusive function

The function hierarchy shows how the functions are related when decomposed. In Figure 1, Function A is composed of subfunctions B, C, and D; Function D consists of subfunctions E, F, and G.

Where functions are exclusive they are shown as Diagram 4. In this example an occurrence of Function A consists of either B or C (but not both). Optional functions are shown as in Diagram 5. In the example Function A consists of B and may also include C.

Where a function consists of a subfunction which is repeated several times it is shown as in Diagram 6. Thus, in the example, Function A consists of Function B repeated several times.

How to decompose functions

Since functional decomposition is best described using an example, a very simple everyday function will be used first to demonstrate the principles, and then a function related to the hospital model will be provided which can be used to the later articles dealing with access path analysis, data flow diagrams and other topics.

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At the next level in our example we have broken down further the task of "Entertaining guests". In order to entertain guests, the tasks of providing dinner or providing tea are undertaken. As each function is decomposed the tasks become more and more detailed and specific. It is also possible to break down the task of "providing dinner" into more detailed tasks, such as "shopping for ingredients", "cooking", "serving", "clearing up", etc.

Diagrammatic conventions

As with entity models the results of functional analysis, including functional decomposition, are documented using diagrams and supplemented with forms which contain extra details.

In Figure 1 the diagrammatic conventions used for functional decomposition are shown. An event is represented by an arrow, a function by an oval box in which the name of the function is written.

Diagrammatic Conventions

Event

Function

Function hierarchy

Exclusive function

Breakdown of functions

Section 1 — Part 10

of our series describing a system design methodology

by Rosemary Rock-Evans

sible at the lower levels in the hierarchy to specify the events which start the function, for example, the function "Provide Tea and Cakes" can be triggered by the event "Visitors Arrive".

1) Each function in the hierarchy is the sum of its sub-functions. A function cannot include sub-functions which are not described or whose meaning is not conveyed by the function name or definition — "Make Tea" couldn't have included "Make Cakes".

2) A function must be broken down into more than one sub-function — "Provide Tea" could not have consisted of one task, "Make Tea".

3) Functions can occur quite legitimately in more than one hierarchy. The function "Boil Water" may also occur within the hierarchy whose main function is "Provide Dinner".

4) The completion of one function in one hierarchy may be the event which triggers off a series of functions in another hierarchy. For example, the function of "Buying the Ingredients" within the

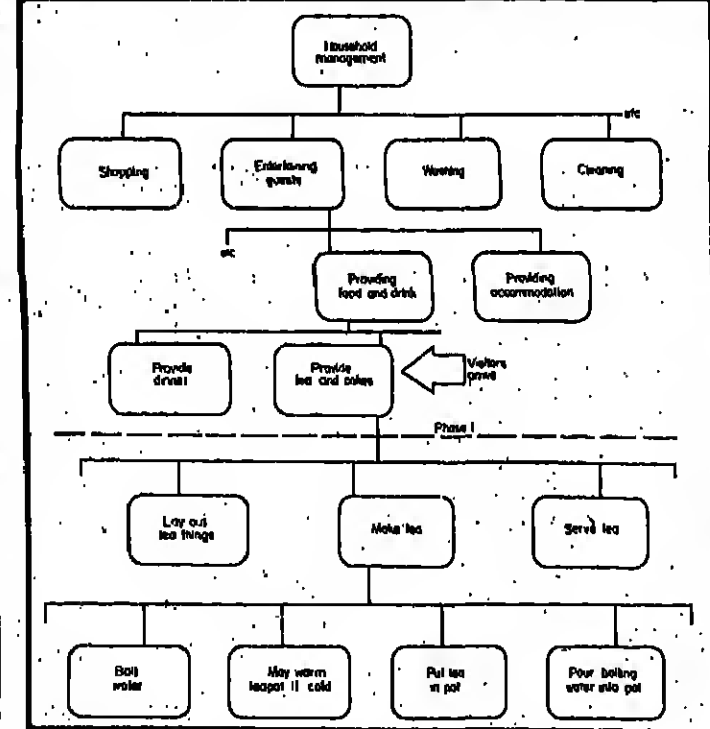
show the sequencing of functions for each event, their dependencies and where parallel activities can occur. (It should be obvious that it is not invalid to have functions completed in parallel, eg the task of making the tea could be done in parallel with the task of laying out the cups and saucers.)

In practice, it is usual to complete the data flow diagrams for each level in the functional hierarchy, in parallel with functional decomposition.

6) There is a danger of defining functions as if one were defining a batch system. This is known as the batching trap and must be avoided, as it can lead to the creation of unnecessary transactions and badly designed programs. Batch data processing forces serial processing of data.

The data is built up into a batch to undergo initial processing and then passed on as a batch to the next process and so on. This form of processing, however, is usually artificial and does not reflect the actual business activities, where the business may actually regard several processes as one function.

For example, "Record & do initial validation on Orders" might be one process, then "Pass Orders against Main File and further validate" might be another process. The user would regard this as one task "Record and Edit Order".



shopping hierarchy may have to be completed before the function "Make Cakes" can start. (These points will be explored more fully in the article on data flow diagrams.)

5) At the highest level, a business will often describe the functions using the present participle of a verb, together with an object (sometimes implied and omitted), eg washing (omitted object — linen). At this level, there will be no sequence to the functions as this form of verb construct is used to imply continuous or on-going activity.

Once the function can be related to an event, however, the verb is used in imperative mode denoting action and the sequence of functions, wherever there is a sequence, can be shown. For example, the event "Visitors Arrive" triggers "Provide Tea and Cakes".

The functional decomposition diagram, however, does not necessarily imply sequence. It shows simply the breakdown of tasks. The use of sequencing in the functional decomposition diagram helps to order the analyst's thoughts and those of the user, but it is the data flow diagrams (a technique which will be described in Part 11) which are used to

The batching trap can also be found within an organisation. If responsibilities have been split between two people, what is, in fact, one task may appear to be two, because of the artificial job split. Wherever information is batched by one person, passed on to another and then unbatched for further processing, there is again likely to be only one function for the tasks performed by the two (or more) people.

7) It may seem an obvious point, but it is worth stating, that only those functions which are relevant to the purpose of the study should be decomposed to any level of detail. Thus if the study's aim is a computer system, there is little point in decomposing functions which contain purely physical tasks, which have no data processing component and are not capable of computer support.

When should functional decomposition stop?

The main advantage of functional decomposition is that the levels of detail can be geared to the stage reached in the project, or to the purpose of the project.

Function Name: Handle Patient's Death	Analyst: R.R.E.
Synonyms: Administration of Deaths	Date: 8.1.80
	Version: 1
	Status: Draft
A patient may die either when he/she is in hospital or is not in hospital. If the patient is in or out of hospital, any operations the patient may have booked are cancelled and details of the death recorded. If the patient is in hospital the bed in which the patient was staying in the ward is freed, so that it can be reallocated. The patient's medication record is also changed to show that the patient no longer requires medication. Details of medication are, however, kept for historical analysis. If the patient is not in hospital any appointments he may have are cancelled, and if he has been well-attended for a ward bed this booking is cancelled to allow the bed to be reallocated.	
Preceding Event: Death of Patient	Frequency: Forty per month
Responsibility: Hospital Administration Dept and Registrar	Location: Central Records Dept

The first stage of a project, for instance, is often the "user requirements" stage, which requires a broad indication of what the user requirements are in terms of functions in order that the users can agree on them and decide priorities before the next stage is started. Functional decomposition would thus be completed down to the level required, probably using the top three or four levels in the hierarchy. (This is shown in our Household Management example as "Phase 1".)

The next stage might be used for transaction design. At this stage in the project, therefore, the function hierarchy would be decomposed further until enough information was known to enable the transactions to be designed. At this stage there would be a decision as to which functions were to be computerised and which were not and what were the priorities. In our Household Management example, this stage might equate roughly to "Phase 2".

At this stage the elementary functions will have been established. An elementary function is not the lowest level function, as it is possible to decompose functions down to the level of attribute types. An elementary function is a function which we do not want to decompose further, because the task is better achieved using English descriptions.

Definition of functions

The choice of elementary functions is not arbitrary; it is based on criteria which will be described in the access path analysis article. It is sufficient to know at this stage, however, that decomposition does not go on and on, but stops at the elementary function level and structured, or plain English descriptions take over.

In Part 11, data flow diagrams will be described. These diagrams are used to show the sequencing and ordering of functions and their dependencies.

The Data Analysis methodology was developed at GAGI by Ian Palmer.

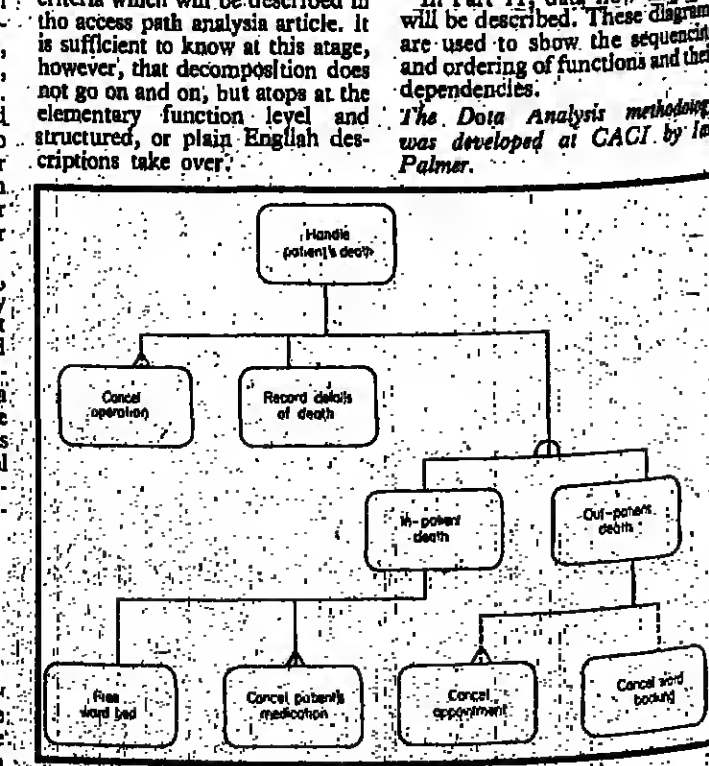


Figure 4

It is an indication of the might of the Japanese economy that two full-blown mainframe computer suppliers can survive and flourish primarily on domestic sales. Those firms are the computer division of Mitsubishi and Nippon Toshiba Information Systems, the company that handles domestic marketing for the computer manufacturing side of Nippon Electric.

Both organisations became established as mainframe manufacturers by forming licence agreements with US firms. Mitsubishi got into bed with Xerox, while NTIS started life with a comprehensive

package of hardware and software licences from Honeywell. Now both organisations are well on their way to a complete break from the US origins of their hardware and software technology.

The Japanese government's VLSI programme, which ended earlier this year, provided them with in-house semiconductor manufacturing and development expertise comparable with any US company. Now the government-sponsored £100 million Electronic Computer Basic Technology Development Association is providing them with

the means to further modify their US originated systems software. The most dramatic change is the move to Japanese language processing.

On a visit to Japan KEITH JONES talked to key men from both organisations. They were Shigeo Imamura, president of NTIS, and Hideo Ohta, director and deputy general manager of the electronic products and systems group of Mitsubishi Electric. This is the organisation which embraces Mitsubishi's computer manufacturing and marketing operations.

Nippon sheds its close reliance on Honeywell techniques

NIPPON Toshiba Information Systems was set up in 1974 to market the mainframe computers manufactured by Nippon Electric Company and Toshiba as the Aco series. The link between the two companies was Honeywell, whose machines were already being manufactured under licence by NEC and which two years earlier had taken over the computer side of General Electric (which had a licence agreement with Toshiba).

Machines built by NEC were the 200, based on the Honeywell Level 62, and the 300 and 400, which followed the design of the CII-Honeywell Bull Level 64. The Toshiba-built machines, based on the Honeywell Level 66, formerly GB 6000 series, were called the 600 and 700.

The next big upheaval was Toshiba's decision in April 1978 to drop out of the computer business, a move which was not dramatically obvious to the outside world because NTIS was handling Toshiba sales.

Every function in the function hierarchy must be defined, so that at every stage there is a definition available from which to work and proceed further.

Thus, if there is a change of analyst, for example, from one stage to the next, there can be continuity in the analysis and no effort will be wasted in redolog work already completed.

In Figure 3 a very simple example function from our hospital model has been documented. Figure 4 the function hierarchy is shown for this description. Notice that for each description of a function only one level below is the hierarchy as described. Carefully appointments would itself involve many subfunctions not described at this level.

Functional decomposition has many advantages over the traditional English Language test approach. Text is always one-dimensional. All the detail has to be forced into the same paragraphs and sentences as the text which gives the overall picture and "sets the scene". Furthermore, the detail cannot be expanded progressively within the text. The description usually has to be rewritten, if more information needs to be added.

Another advantage is that the task of function decomposition can be partitioned and allocated very easily to different analysts. For instance, one analyst could study Hospital Scheduling, another Admissions, and so on.

In Part 11, data flow diagrams will be described. These diagrams are used to show the sequencing and ordering of functions and their dependencies.

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Figure 3

Figure 4

jointly for the two companies, NTIS was also the agency setting out on behalf of NEC and Toshiba in the VLSI scheme, so MITI was able to carry on paying out without losing too much face.

About 400 of the 800 work-force at NTIS are still engaged in VLSI development.

To fill the gap left at the top of the Aco series by the withdrawal of the 600 and 700, NEC brought out the Aco 77/500, 800 and 900, and has now topped out the Aco family with the formidable Aco 77/1000. This machine was introduced in September with features that include a power rating of 15 million instructions per second, up to 64 megabytes of main memory and 64 channels with an aggregate data rate of 100 megabytes.

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systems to achieve at least a degree of compatibility. The current line-up of operating systems, Aco 2, 4 and 6, were completely different from GCOS and the difference would become greater, he said.

The desire of NTIS to move away from Honeywell technology was no doubt encouraged by Honeywell setting up its own Japanese subsidiary about two years ago. When NEC's licence agreement with Honeywell expires in 1982, any new contract signed by NEC will cover only a few essential features retained by the NEC machines.

Imamura pointed out that the VLSI programme enabled NEC to move away from Honeywell on the hardware side, while the Basic Technology programme was now consolidating NEC's independence in the area of software, he said.

The VLSI laboratories of NTIS and the NEC semiconductor manufacturing centre are both located on Kyushu, the southernmost of the main Japanese islands. Kyushu is sometimes dubbed "Silicon Island" because of the preponderance of semiconductor manufacturers there.

Imamura pointed out that the role of NTIS was primarily a domestic one and that the overseas marketing of NEC computers was handled by NEC itself. One exception was the Middle East where NTIS was selling machines to un-

But the main preoccupation of NTIS at the moment seems to be getting NEC's Japanese language software into shape for the domestic market. It is not interested in buying applications packages from UK software houses, despite the hopes of the Computing Services Association that it may pick up some Japanese businesses, and there are certainly no plans to sell NEC packages in Europe.

Toshiba still owns 40% of NTIS and is participating with NEC in the government's Basic Technology programme. There are signs that Toshiba would like to get back into the small systems market even if it continues to give mainframes a wide berth.

Fujitsu is understood to be developing the Chinese language system with the Municipal Scientific Committee of Tianjin City in China.

More than 3,000 Kanji characters are in common Japanese use. With JEF the data entry method involves either a keyboard with thousands of keys, or a touch-sensitive tablet where thousands of individual characters can be entered using a hand-held pen.

Many Japanese computer systems aimed at the domestic market can now process symbols in the form of Japanese writing — a mixture of Kanji symbols and Kana phonetics. The sold \$300 system allows users to accept far more characters than its keyboard can handle by spreading them on to 16 pages. The designation of the keys changes as a page is turned.

Asked why Mitsubishi has no plans to market the machines overseas he said that the Japanese market offered sufficient potential, in that at least 70% of the user base had IBM or IBM-compatible machines.

According to Hideo Ohta, Mitsubishi's policy is not to go over eight maps with the new IBM com-

patible machines and any Mitsubishi machine needing a computer more powerful than that would be free to ally with IBM or go to one of the other Japanese suppliers.

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The Tokyo headquarters of Nippon Electric Company's 80%-owned subsidiary, Nippon Toshiba Information Systems.

named customers.

NEC activities in the US at the moment are confined to selling Asura, a small business system that is now starting to get off the ground after a lot of problems with inadequate software. Imamura said that 200 Asuras were installed already in the US and that the plan was to sell 500 there this year.

Domestic

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Fujitsu aims at China

WESTERN computer manufacturers hoping to break into the potentially enormous Chinese market would be advised to follow the lead of Fujitsu, which is developing a Chinese language processing system.

It will be a substantially redesigned version of JEF, Fujitsu's existing Japanese language system, the principal common area being acceptance as input of Kanji characters.

Originating in China, Kanji forms a major part of Japanese writing, albeit with many modified characters. It supplements Katakana and Hiragana, the Japanese phonetic alphabets.

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A slow and painful path to office of the future

We all enjoy speculating about the office of the future. What better test of the imagination than to day-dream about serene, efficient office landscapes dotted about with workstations and VDUs, and not a scrap of paper in sight.

The electronic office will be a reality one day, but a staggering amount of change has to take place before today's office can become the office of the future. It will be a slow and painful process involving dedication on the part of the marketing and technical people; and it will face office managers and unions with some tough decisions.

All these people will have to work closely together - and this is not always easy.

The problem is that every step involves difficult and weighty decisions between widely differing strategies.

Take wiring up, for example, one of the biggest headaches for

the manager contemplating investment in office systems.

He needs badly the enhanced communication that multi-station electronic systems provide, but his office building is already festooned with wire, bursting from every duct.

If he must submit to the chaos and expense of rewiring, he'd like to do it once and for all. What's the right solution?

Bandwidths

There is a wealth of advice obtainable about wiring up. Since the advent of local networks, marketing and technical people have begun to favour broadcast packet-switched networks whose ancestry can generally be traced back to Xerox's Ethernet.

Running at speeds up to 10 megabits per second, these networks have ideal performance character-

istics for the next few years' office systems.

But they use coaxial cable, not the easiest kind of wire to thread along a meandering duct. There is also cause for concern about the ability of these coaxial networks, once installed, to cope with the far higher bandwidths needed in the future.

Rather than wire up, we also try to live with what we've got. Some office systems manufacturers are capitalising on the ability of installed telephone cable to handle digital data at speeds up to 64K bits per second.

Buy a centralised system, and you can connect high speed terminals via your installed telephone network. This approach provides breathing space for those who can't face a rewiring upheaval, but leaves unaltered the problem of accommodating devices requiring speeds above 64K bits per second.

Logica VTS feels confident enough about the Ring to have progressed a long way towards an-

How does British technology, such as the Cambridge Ring, measure up as a solution to this problem? The Ring is a local network of a rather different kind from Ethernet and similar systems.

It operates on the "empty slot" principle, as if there were an express train circulating continuously, on and off which data packets can jump.

It has plenty of bandwidth for office applications. For the office manager, it has the decided advantage of requiring only a simple twisted-pair.

Concern is often voiced about the Cambridge Ring's vulnerability to damage of a Ring segment, causing all traffic to stop; the so-called "man with a spade" problem.

Logica VTS feels confident enough about the Ring to have progressed a long way towards an-

Safer with paper

PICTURED here with a Wordplex 1 word processor is Rosemary Gaskell-Taylor, a director of the secretary in the NatWest's merchant banking subsidiary who says: "I am confident there will be a job for me at the end of the decade."

"The word processor," she continued, "has left no one in our department unaffected. Most of us have found our typing speed has increased, partly because the

touch is so light, but mainly because the psychological barrier of worrying about mistakes has disappeared."

She reckons you don't need mechanical aptitude to operate and is all in favour of modern technology.

"However," she says, "until the office systems are more reliable I shall feel safer with bits of paper to shuffle around."

nouncing a Ring-based local network product.

Another big question mark hangs over the introduction of the Electronic Filing System as a replacement for the familiar filing cabinet. This is a typical example of the kind of change that seems both natural and beneficial.

On further inspection there are all manner of potential problems.

Consider, for example, the many kinds of file kept by a secretary, and then try to imagine representing them electronically. They include correspondence files, invoices, purchase orders, memos and reports, all filed away neatly in nearby cabinets.

Little heaps

In addition, the secretary keeps binders, ready to hand, of frequently-used documents and frequently-updated files. She has in- and out-trays and a pecking tray, that see a constant flow of documents.

She keeps little heaps of telephone messages. And, of course she has all manner of address lists, check lists, distribution lists, not other lists that are constantly referred to and updated.

It's difficult enough to devise an electronic system capable of representing all these files, but to do so and provide adequate speed of access is well nigh impossible.

The wary office manager is advised to consider very carefully the limitations of electronic filing techniques before committing to any one approach.

Before setting up the system, the manager must pay careful attention to avoiding built-in obsolescence.

Lurking behind the electronic filing issue is an even more formidable problem: document representation. If we want our electronic files to be useful, we must ensure that the filed documents are legible no matter what device was used to create them.

But in any large organisation we should expect to find many different kinds of electronic office equipment. It is true that some organisations standardise, but even they have problems with headstrong managers who insist on buying odd-ball equipment.

As time passes, more and more types of equipment are contributing documents to the file, and the chance of being able to read any document on one's own equipment decreases.

This problem will be solved only when a standard method has been devised for representing documents; this is a tall order as documents created on the typical present-day word processor contain all manner of formatting effects.

Consider next the problem of accommodating all of today's word processors, and you can understand the magnitude of the problem.

There are new representations like Teletex, but Teletex hardly scratches the surface of the format-

ting issue. With office systems companies moving aggressively into integrated text-cum-voice systems, exemplified by Nexos' Delta, many current notions about documents will require radical changes.

Local communication, filing and document representation are three major issues that we face in moving towards the office of the future. Progress on each issue is difficult. Underlying the discussion is a fundamental problem: a lack of agreement about the electronic office as a goal.

For example, there is disagreement about who will use the terminals that will populate tomorrow's office; will this remain a clerical worker's, typist's and secretary's prerogative, or will professionals and managers join the ranks of the users?

Is it possible, as some users fear, that office systems will do away with large numbers of clerical jobs?

Nasty surprises

The answers depend very much on what kind of electronic office systems we design, manufacture and market.

The different groups involved in office systems - technical, marketing, managerial, unions - are beginning to develop their own views of what the future will bring.

This is unfortunate, since it guarantees some nasty surprises in the long run. The office systems community badly needs a short-term common focus to bring the various interested parties together.

Office system market trials are beginning to fill the vacuum. To learn answers to the above questions, without risking a disastrous commitment of resources, some organisations are installing innovative office systems on a trial basis, to gain experience and understanding.

Increasingly, they are involving participation from unions, managers and technical people. Early US pioneers in this field were Citibank, with its Lexar System, and Xerox market probes in the White House.

In this country, the government's Central Computer and Telecommunications Agency (CCTA) has been active in market trials of word processing equipment. Within the more general office-systems field, British Telecom is taking a step with Project Albert, Phase I of which has been contracted recently to Logica.

Market trials are so important a way of making progress towards the office of the future, because they permit difficult decisions to be made at lower risk and with a better chance of learning for the future.

Market trials place the emphasis on learning from experience; this is what Britain needs to retain a leading position in the electronic office.



Call for message services with a human interface

by Dr Ken Beeuchamp of Lancaster University

ACALL for powerful message services designed around specific applications with tailored human interfaces and even specialised terminals was made at IFIP 80 by Professor Peter Kirstein of University College, London.

In an address on "New text and message services", Professor Kirstein expressed on overall theme for the conference when he said that far too often the various communications services required by the user were considered in isolation to each other and compatible standards were not being developed fast enough either by the organisations providing these services within a given country or by the international planning committees.

He also warned that easy access via public data transmission systems were essential and that any service must be economically viable. Those countries which adopted a flexible and enlightened attitude to the questions would have a clear economic and social advantage over those which did not.

Growing

Dr Philip Hughes of Logica said the Eurodata '79 Survey, undertaken on behalf of 17 Western Europe PTTs, demonstrated that the usage of data communications in Western Europe is growing more rapidly from a bigger base than was previously thought. Dr Hughes indicated some of the main estimates for 1979 and Eurodata's forecasts for 1987.

It was encouraging to find a strong degree of similarity between countries. There was less difference in the level of data communications usage between countries than there is between industries, said Dr Hughes.

Within the overall market estimates there are strong movements by users towards the lower costs and higher performances offered by the PTTs for new services such as teletex and videotex. These are expected to be popular and their rapid adoption by users is expected to lead to a substantial increase in the relative importance of the application concerned.

Network Termination Points (NTPs) are growing at a rapidly increasing rate with a noticeable trend towards the higher speeds, particularly 9,600 bits per second. The forecasts suggest that 30 per cent of all NTPs in Western Europe will be on public data networks by 1987.

Changes

Distribution of applications is expected to shift away from general management and banking towards person to person communications and information retrieval. These changes will be brought about by new services and technologies, such as teletex and digital

facsimile, all expected to boost the rate of application growth to become the second most important application of data communication with 78,000 terminals in Western Europe by 1987.

The study also suggests that there could be 2,700,000 domestic videotex terminals at the end of the forecast period, he concluded.

Many similar expressions of confidence in Europe's technological future were made by other speakers. M. Texier, representing the Direction Generale des Telecommunications, France, spoke of the importance of early definition of the new telecommunications administration.

He outlined recent ISO and CCITT work on the definition of a model for network architecture, its advantages and limits. Special emphasis was being made on a network-independent transport service - now a key issue identified by many speakers concerned with standards issues.

Much work had been done using primitives. Despite difficulties in defining a family of transport compatible protocols this was the only real way forward, he said.

In describing services France will provide in the next few years, Texier said that one videotex terminal would be given to every current telephone subscriber in the Ile de France region by 1982.

Gateway

Similar themes were referred to by Professor Inoue of Tokyo University who surveyed fast developing communications in Japan and the development of internet-work facilities, satellite communication and radio nets.

Several papers described the difficulties of protocol conversion and the requirement for gateway services. M. Perragu and his colleagues from CCITT in France provided details of an international gateway being developed to link Transpac to other public packet networks.

These include Telenet, Tymnet and Burotel and a future version will also include the Canadian Datapac, the Japanese Vnet and the emerging Spanish network.

This gateway offers a virtual call service conforming to X.25 and X.25 and works with a multi-line transfer procedural operation Level 2.

Queuing

Multi-netting has created its own set of problems. Professor Kleinrook from California University gave a paper on a queuing problem. He considered the situation in which two buffered packet radio units interfere through sharing a common slot in an Aloha broadcast channel.

His solution was a scheme called topological approximation, which allows to replace approximate calculations of an exact model with an

exact solution of an approximate model obtained by perturbing the topology of the interference. This was an elegant, if highly theoretical, paper.

Dr Manning, of Waterloo University, Canada, gave an outline of his work over the last six years researching into distributive computer systems.

Taking us through several stages of development involving the Mininet system, two variants of the Moose system, HXDP, KO-COS and CMMF, he concluded that a set of processes running in disjointed address spaces and provided with a message-switched IPC appears to offer several advantages as a model for software design. Among these are claimed the ability to distribute a set of processes among machines with minimal impact on design.



HUGHES... Within overall market estimates, there are strong movements by users towards lower costs, and higher performances offered by the PTTs for new services, such as teletex and videotex, are expected to be popular and their rapid adoption by the user is expected to lead to a substantial increase in the relative importance of applications concerned.

Electronic mail boxes are high on agenda

SIXTEEN key issues have been identified by the new IFIP working group 6.5 on international computer message services, Dr Uhlig, the chairman, told a panel session.

One of these - the use of computers to mediate human to human communications in the form of electronic mail boxes - has been the subject of much discussion in and outside IFIP, especially by members of the DP community concerned with social and economic implications of computers.

Taking part in the IFIP panel session were Ms Feinter, currently with SRI International, who described the work of the Arpanet information centre; Professor Kirstein who talked about the need for international agreements on message services; Dr Naffab from IRIA; and Dr Gupta from India who stressed the be-

social impact of "leap frog" technology which message switching could have on developing nations.

Australian PSS

AUSTRALIA is to bring into service by 1982 its own public packet switching service network which will run at 48,000 bits per second. Called Austpac, it will be similar to the UK's PSS system and will conform to the CCITT X25 and X28 standards.

The first switching centres are to be based at Sydney and Melbourne. The packet mode terminals will be limited to 9,600 bits per second and asynchronous mode terminals, using a packet assembler/disassembler, will operate at up to 1,200 bps.

CMC SOVEREIGN now with ANSI 74 COBOL!

SOVEREIGN - Computer Machinery Company's Multiple Processor Keying system which provides data entry, data communications and user programming on the same system - can now be supplied with COBOL... as well as the ever popular BASIC.

CMC SOVEREIGN with ANSI 74 COBOL is available in the British Isles only, under Microdata licence.

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38 delivers

The productivity advances of IBM's new System/38 are being confirmed in early installations.

IBM has started delivering System/38s to customers.

And customers have started delivering comments like these to IBM:

"RPG III and the interactive data base utilities are helping us to implement new systems quicker than we ever thought possible."

Mike Finch, Hospital Savings Association, London.

"I created a special equipment report in 15 minutes flat. Before, it would have taken a day and a half of programming."

Chuck Potter, Data Processing Manager, Reed Machinery and Supplies Company, Minneapolis.

"We've developed an online order entry system with one-third the effort and the application is much more polished. We're very pleased."

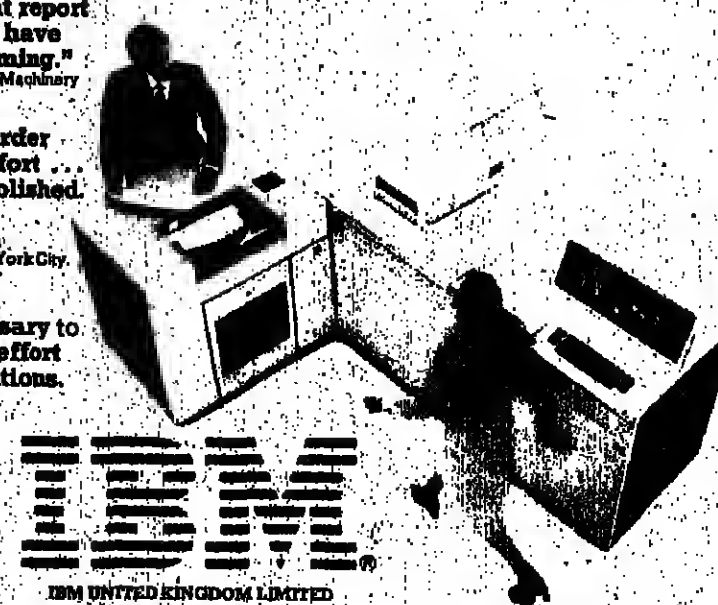
Larry Krueger, Director, Corporate Information Services, United Merchants and Manufacturers, New York City.

"The System/38 significantly reduced the amount of code necessary to write a program and the time and effort required to move into new applications. We're extremely enthusiastic."

Murray Peterson, Director of Data Processing, St. Olaf College, Northfield, Minnesota.

And we're enthusiastic, too. Because our new System/38 is a compact system with advanced features rarely found in any computer, large or small. In short, System/38 delivers. And it can deliver for you.

For more information call Jim Foster on 01-940-9848.



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PDP under RSX/11M FORTRAN programmer for immediate start.	257	City
IBM System 34 and 38 RPG II programmers, long contracts commencing Spring 1981	255	Finland
ICL 2870 VME/B + IOMS experienced personnel	260	U.K./M. East
IBM 3031 OS Cobol programmers	249	Dorset
IBM 4341 Cobol + IOMS programmers and analysts	266	Holland

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We have a growing number of opportunities for experienced people to work at various
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KNIGHT OPERATIONS houses a full recruitment and contract service to the computer
industry. We've been around for a few years now, and if you have too, and you're looking
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If you have a minimum of 9 months' experience on an IBM mainframe with OOS VS then
our client would be interested in seeing you for their 3031 installation. This position holds
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SALARY: £3,500 + 20% shift allowance.

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Senior Operator Holland

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Split day shift.

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For full details of the above and other permanent vacancies — phone Rachel Martin or
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The tremendous success of Cincom's product range
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You will become a specialist on the application of
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This is a senior position for which you will need to
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Offering at least FIVE YEARS' RELEVANT MINI-
COMPUTER SOFTWARE EXPERIENCE you will
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An outstanding opportunity exists for a Systems Analyst to
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The group is responsible for the development of an interesting
and varied range of new systems for the investment trusts and
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users, facilitating rapid interchange of information and pro-
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This is a first-class opportunity for Analysts seeking a career
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Prospects for future career progression are excellent providing
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REF: E1/0412

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This is something different; an opportunity for a young
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the routine of project development in a large team and join a
small group providing a range of computer services and
support to users.

The company is a major petro-chemical and energy resource,
engineering organisation which has an impressive record of
growth and success throughout its history. That success is
continuing today and as a result demands on the computer
services department are very high. Large IBM and Univac
mainframes are used for major systems but a range of smaller
computers for specialised applications are also used.

The person appointed will ideally have some experience of
COBOL and/or Univac 1100 systems and will provide diverse
support services to users as well as developing small systems
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REF: SW2/0442/CW

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A manufacturing company is seeking an experienced person to assist in the development of a variety of commercial systems. Applicants should ideally have a strong IBM-COBOL background and be familiar with on-line applications. Exposure to minis would be an added advantage. 503/CW.

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Central London c£8,500

Date Processing Professionals, with at least two years' commercial programming experience, preferably on SYSTEM 34 hardware, are required by our client, a subsidiary of a multinational oil group, to develop various financial systems for a distributed processing network covering five London locations. 504/CW.

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Are you receiving sufficient rewards for your efforts? If not, a major UK computer manufacturer needs you to cover the Norfolk, Suffolk, Essex, Cambs. and North Central London areas.

Product range includes commercial transaction processing systems, remote job entry terminals, systems for processing scientific data, microprocessors with communications capabilities and associated software. Applicants should possess proven selling experience of similar products. 108/CW.

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E.C.1 £7,000 + car

Senior Programmer/Analysts, if you are bored with your daily routine, why not inject a bit of life into it by finding out more about vacancies with this computer company marketing minis and micros, with its own systems house. Advantages of the job are that it allows project leader type of involvement from pre-sales consultation to implementation. Applicants should have broad analysis experience of financial accounting applications.

Trainer should possess good commercial knowledge and OP understanding, with experience of developing/installing accounting systems and now wishing to diversify into a training role. 104/CW.

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SENIOR PROGRAMMERS

Bucks £7,500-£9,000 + car allowance

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- £12K + IBM 370 engineers to work in London or S.W. area. CPU or peripheral experience.
- £10K + Snr. engineers with DEC 11 experience for project and technical support.
- £8K + Mini engineers with DEC, Prime or DG experience for turnkey systems supplier. London, south and south west.
- £7K + Engineers for a major mini manufacturer, positions in Edinburgh, Sheffield, Manchester, Nottingham, London, Middlesex, Surrey and Berkshire. 2 years F/S experience preferred, mini or m/f.
- £6K + Mini/word processor engineers, 1 year's experience for expanding company in central London.
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Overseas DEC 11 Engineer for contract in Kuwait. Married or single status.

Capp Associates specialise in computer engineers, and can help you find a position suited to your skills and experience. Our clients require personnel at all levels from junior engineers to UK service managers, so if YOU are looking for a step up, telephone or write to our Engineering Consultant - Phil Chapman.

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Senior systems analysts

£10,000-£13,000 p.a.

Major development of real-time commercial systems

Our client, a leading publicly quoted group of companies, is implementing major new computer developments for its subsidiaries and depots. The systems are operating on a network of PDP 11/34 and PDP 11/70 computers installed throughout the United Kingdom.

The Group now wants to strengthen its development team with the addition of Senior Systems Analysts to continue the development of systems and installation of computers. They will join a recently formed group computer services department with a policy of promotion from within. Present location is Kings Cross, moving next year to the Strand.

- * Minimum of 5 years computer experience
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hoskyns

JBA

Sales Executive

London c. £18,000 + Car
We have been retained by a highly successful systems company to recruit for them an experienced Sales Executive. Candidates will be required to sell a range of equipment which is based on software driven terminal systems which, at entry level, are plug compatible. These include IBM, ICL, Honeywell and Univac, but have the capacity to support a wide variety of software and hardware in the distributed processing marketplace. It is essential that applicants have at least three years experience and can provide a proven sales record to date.
Contact: David Hendry

Communications Consultants

London based to £15,000
JBA have been retained by a leading computer and telecommunications consultancy to assist in the recruitment of high calibre technicians who will be based in London, although opportunities exist for work abroad as well as in the U.K. Selection criteria include a detailed knowledge in at least one or more of the following areas:

- * Packet Switch Networks
- * Message handling and Front-end Systems
- * Network architecture
- * Protocol conversion
- * Software Engineering

Candidates will have been working in one of the above areas for at least 6 years, either with a computer/communications equipment supplier, a consultancy, or a large data communications user organisation. A good degree or equivalent professional qualification is required. Salaries commensurate with experience, will be in the range £10,000-£15,000.
Contact: Margaret Stevens

Senior Analyst/Programmers

Dublin to c. £11,000 + benefits
An established systems house operating throughout the Republic from the Dublin office currently have urgent need to strengthen their project teams. Working mainly on financial systems on IBM hardware, you will be responsible for assessing client requirements, designing, programming and implementing the specific systems and be involved with all aspects of customer support. It is essential that applicants have sound commercial analysis knowledge with several years COBOL and DLI as well as good experience of a CICS system. You must also display the ability to communicate at all levels and be prepared to travel when required. A negotiable salary is available, expenses and an annual bonus.
Contact: Brian Postles

Software Engineers (Micros)

Berkshire £8,500 +
Our client, a market leader in the engineering industry, has established a new division in microprocessing, and now needs micro software expertise to fulfil current and future projects. It is essential to have at least two years experience of micro software development on industrial systems, a good educational standard i.e. a degree or equivalent in a science or related subject. A knowledge of INTEL machines would be a definite advantage. Candidates would ideally be in their late twenties and have the ability to communicate at all levels.
Contact: Janet Chilvers

Reservation Systems Maintenance Manager

Dover Salary negotiable to Experience
We have been retained by a leading ferry operator to recruit for them an experienced computer professional to take responsibility for the on-going maintenance and development of a sophisticated real-time reservation system. The successful candidate will be required to liaise with outside software suppliers and to co-ordinate the activities of user departments. A strong ICL background coupled with exposure to on-line systems is essential. This is an unusually demanding role requiring a mature individual with sound administrative capabilities who is able to work under his/her own initiative. An excellent salary together with concessionary travel.
Contact: David Hendry

Communications Programmers — Babbage

South West of London £8,000-£9,000
Continuing expansion of our client's international video business has created opportunities for GEC 4000 Babbage programmers in real-time and network systems. Applicants should have at least four years programming experience and be capable of tackling packet switching, colour and business graphics, in this fast moving and exciting field. Possible overseas travel.
Contact: Jim Baker

Mini Support Analyst Programmers

London £7,000-£8,500
Due to steady expansion, our client, an internationally known mini manufacturer, specialising in the marketing of banking, word processing and library circulation systems, wishes to recruit two programming professionals to join their development/support team. A minimum of two years on-line programming experience, preferably gained in a mini environment, would be ideal, but consideration will be given to other high calibre candidates. Training facilities and career prospects are excellent as this organisation firmly supports promotion from within.
Contact: Isabel Bruce

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Our client is looking for experienced programmers who would relish the opportunity to take responsibility for technical system design, and who will also be able to provide the technical leadership for the programmers on a project team.

You will be working for one of the largest and most secure international companies in their sector throughout the world. They are also highly progressive and are in the forefront of office automation. The data processing organisation has a history of expansion and offers excellent prospects of further career development.

They use twin IBM 3032 processors and have a network of 300 terminals including distributed processing supported by IBM 3730's and 8100's.

But whatever your equipment or language background, our client's major commitment to training will ensure that you will be brought right up to date on IBM equipment, and stay there.

The company will pay you an excellent starting salary of up to £9,500 p.a. together with other benefits. If you need to move house, there is a choice of attractive and affordable properties within easy reach and relocation assistance will be provided.

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The Product Engineering Group provides a high-level technical support service to users throughout Europe. This includes the provision of a consultancy service on network design and application, system specification and costing, monitoring new development in the market and training users.

The general requirement is for candidates who are educated to degree level in either Electronics, Physics or Computer Science with post-graduate experience in either data-communications technology, digital electronics or micro-processor application.

Dealing with prospects and users throughout Europe a degree of international travel will be involved and the ability to work without immediate supervision is therefore important. The company can offer extremely bright prospects for future career development coupled to a high commencing salary and valuable conditions of employment including comprehensive relocation assistance. Telephone to discuss these opportunities in detail or alternatively write to us quoting reference SW1/0412/CW.

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BROADEN YOUR HORIZONS MIDDX./SURREY £7,000-£9,000

Based on the Middlesex/Surrey border, our client is a well-known major organisation able to offer a secure future and positive career progression. They make extensive use of a wide range of hardware and successful candidates can expect to broaden their experience to encompass UNIVAC and the IBM 4300 series of computers.

Additional Programmers and Analysts are now required to enhance the development team which is about to embark on various new interesting projects.

PROGRAMMERS with a minimum of TWO YEARS' COBOL experience on any mainframe and ANALYSTS with a programming background plus two years' systems analysis should contact Myriad now, quoting reference C1/0412/CW to learn how these vacancies can benefit you.

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ARE YOU INTERESTED IN:
★ Information Technology.
★ Microprocessor Applications.

HAVE YOU:
★ One year or more Assembler experience.
★ Potential to utilise the latest advances in software technology.
★ Ambition to develop with a rapidly expanding and successful company.

Our client can offer unique opportunities for software programmers, at all levels, keen to pursue a career within an organisation recognised to be at the forefront of this major growth area.

The company offers excellent conditions of employment including a generous relocation package where appropriate. A first-class starting salary will be offered coupled to outstanding long-term career prospects. Telephoning now to discuss these positions in detail or write quoting reference SW4/0412/CW.

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REAL-TIME SOFTWARE DESIGN

London Up to £12,000

Our client is an established supplier of quality real-time and other computer bureau services to several blue chip organisations.

They are a technically adventurous organisation, having designed their own database and real-time systems. This has meant that they have a much more interesting technical section than is usual in a commercial environment. The result is an opportunity for graduates to be involved with real-time systems, database and data communications software.


A major enhancement of the twin CPU's together with a significant expansion of the intelligent terminal network will give further opportunity for the group (of four people) to develop their skills and give full job satisfaction.

If you have substantial system software experience (perhaps five years or more) and are seeking a technical challenge in a company that provides significant benefits in addition to salary, and has offices in an interesting part of Central London close to tubes and with easy access to mainline stations, then ring us, in confidence, quoting reference 315. (Messages will be recorded after hours.)

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datascene

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BANKING D.P. PROFESSIONAL

Nordic Bank Limited, a leading London Consortium Bank, is seeking an experienced and professional person to augment its existing data processing department.

On-going development of the main banking system has created the need for a responsible, self-motivated person to assist with the enhancement of the data processing facility. The Bank currently utilises twin PDP/11/70 machines running in both real-time and batch mode, and a recent addition to the hardware has been a sophisticated word processing and telecommunications device capable of supporting multi-work stations.

The successful applicant will have developed his or her career at some stage in a **BANKING ENVIRONMENT** and have at least three years' AIMS experience allied to responsibilities as a senior programmer or team leader. The duties would entail a reasonably high programming content, but the candidate would also be involved in the training of existing programming staff, acceptance testing and user contact.

In addition to a competitive salary the usual bank fringe benefits will apply.

In the first instance please contact Roger Wilkins at Datascene quoting ref. R4584.

Datascene International Limited, Scapire House, 160-173 Regent Street, London W1R 7FB. Telex: 25851. **datascene 01-439 7871** 24 hour answer phone

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Area Sales Managers - to £16K + Car

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Quadrant Software Ltd.
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SYSTEMS ANALYSTS, DESIGNERS & PROGRAMMERS
with knowledge of

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Opportunities exist in the
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Quadrant is a well established expanding software house
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Our clients are developing a wide
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- IBM 370, 303X and 4300
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We offer:

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JBA

SAUDI ARABIA
Analyst/Programmers
to £19,000 + car + accom.

This established software consultancy is continuing to expand rapidly and has an urgent requirement for experienced Analyst/Programmers. Working in the areas of on-line commercial applications, including inventory control and accounting, you must be dedicated and energetic and be capable of taking projects through from feasibility to on-site implementation. Essential qualities are: 3-4 years COBOL, plus substantial analysis experience during this period, gained preferably on IBM SYS 34. Bachelor status is preferred but equal consideration will be given to married applicants without children. Tax free salary, plus furnished accommodation, plus a company car are included in an excellent package. Initial interviews will be held in London.

Contact: Brian Postles

Communications Consultants

London/Berkshire to £15,000

An internationally known systems house are currently looking for people experienced in the design and implementation of large scale distributed computer systems. It would be preferable to have IBM experience but not essential. For senior appointments, candidates must have been involved in the implementation of a network using IBM SNA. It is essential for all candidates to possess a broad understanding of software and an in-depth knowledge of the concepts and practices of communications interface software.

Contact: Janet Chilvers

Software Engineers

South West of London up to £13,000

Further growth in our client's international Videotex business has created openings for Software Engineers to work at various levels on exciting new product development. Candidates must be graduates with a minimum of 8 years experience, at least two on real-time multi computer systems.

Ability to develop high performance, multi-lingual software products to exacting new international coding standards is essential. Knowledge of packet switching, colour, business graphics or data-base indexing techniques would be an advantage. Opportunities exist for international travel.

Contact: Jim Baker

Senior Systems Analyst

City £11,000 +

We have been retained by one of the U.K.'s largest transport service organisations, to recruit an experienced systems analyst in a senior role within their development division. Systems are all in a financial/commercial nature, and are used in either on-line or real-time environments.

It is expected that candidates would have good academic qualifications, a sound data processing background, and the ability to deal with users and their problems.

Contact: Janet Chilvers

Analyst/Programmer

Hertfordshire neg. to £10,000

Our client, a well established marketing company who specialise in sound recording equipment, are currently expanding their D.P. department. They are developing a sophisticated real-time sales and distribution system as well as order processing and general batch, all of which use data base techniques.

They require an Analyst/Programmer to assist the Computer Manager in the development and maintenance of their ICL 2904 site. The successful applicant will be required to have a working knowledge of COBOL, and be able to work under his/her own initiative.

An excellent salary coupled with attractive fringe benefits complete the package.

Contact: David Hendry

Programming Team Leaders

City to £10,000

Our Client, an International Shipping organisation, is embarking on a major programme of new applications development and is seeking two Senior Programmers to lead existing project teams.

It is essential to have at least four years programming experience, consisting of two years on IBM mainframes using COBOL, with extensive knowledge of OS/360. The ability to write program specifications and modularizations is of prime importance.

Contact: Isobel Bruce

Senior Systems Analyst

N.W. Kent up to £9,000

Our client, a successful specialist engineering and manufacturing organisation, has an opportunity for a Systems Analyst who is looking for a career step with considerable future potential.

Candidates should be graduates, or professionally qualified, with an extensive systems background in developing commercial applications, preferably in a manufacturing environment using ICL equipment.

This is a key appointment in D.P. development and applicants must have the personality, presence, leadership, intellect and capacity to deal with all levels of management and staff. Large Company benefits.

Contact: Jim Baker

Programmers — Financial Systems

Rural Hampshire to £7,500 + Mortg. Subsidy etc.

A large and expanding insurance Company are currently seeking experienced COBOL programmers to strengthen their project teams involved in development of sophisticated financial systems.

Current configuration includes: Redifon 1000 and Burroughs B6800 mainframes. Incorporating batch systems and on-line leasing facilities.

Experience must include 18 months COBOL, not necessarily in a financial institution. An excellent training programme has been devised to assist career progression.

Absolutely first class package to include mortgage subsidy, low interest loans, sports and social club, generous relocation expenses, plus others.

Contact: Brian Postles

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.



MIDLANDS APPOINTMENTS



Effects of recession on the job market

by John Wood, managing director of EMS

Advances in technology have made many users largely independent of computer specialists. Added to the financial cutbacks made by many companies, they result in fewer jobs for DP staff, and those few have very stringent requirements. John Wood reviews the job scene, in which many DP people now find themselves unemployed.

At the present time, it may well be of interest to the market to realise that recruitment demand on a national scale has dropped by approximately 75% throughout the market base. Almost all advertising nowadays is placed by consultancies competing against each other, often for the same basic jobs, in the hope of weathering the effects of the recession, and often these companies advertise jobs which have not yet been fully approved or customer budgets anyway.

The companies most able to adequately ride the effects of this recession, the large adequately funded multi-nationals and long-established public corporations, have almost entirely re-organised their development planning within the DP sector and have cut back on recruitment altogether.

An interesting trend is now becoming powerfully self-evident: the only jobs generally available today are for specialists or technicians. The day of the standard over-

prized Cobol programmer with inadequate qualifications and poor background experience is rapidly coming to an end. The market has no interest in trainees, juniors or anyone unable to contribute directly and immediately to departmental achievement.

Experience

The only people generally in demand nowadays are analysts with experience of online systems, database or network systems. In addition, programmers need to have either database experience or some experience of minicomputer systems, preferably in addition to three or four products from IBM, Honeywell Level 6, DEC, odd incidental requirements for the rest of the marketplace.

Again, an interesting fact emerges. A number of candidates are coming on to the market who are technically obsolete; the market is unable to value the product owing to almost total lack of demand.

Redundancy is escalating already within the industry and in the Midlands alone, with the collapse of literally hundreds of significant-sized organisations which have now gone into liquidation, there are already several hundred people available in the job market.

It is possibly a fair statement that many hundreds of people either recently made redundant, or about to be made redundant within the DP industry, will either have to accept jobs in future at a significantly lower salary and seniority than those to which their careers had originally progressed in order to get back into the industry where the rare opportunities may occur, or that the vast majority of such people may well find that the industry simply has no place for them any longer.

The direction of the industry is clearly changing and the changes are occurring mainly because of the independence of users. A high percentage of delegates attending exhibi-

tions and seminars tend to be finance directors, accountants, sales managers and stock production managers, all seeking their own independent facility divorced from central installations.

They will have to wake up to the fact that they have one, or at best two years to deliver all pre-committed outstanding systems into the hands of the users. After that, the impact of market penetration by the mini and micro vendors into their own companies will cause severe cutbacks in operating budgets available to central departments in future.

Survival

The vested commercial interests of the mini and micro vendors, which include the central mainframe manufacturers themselves, are now so pre-committed that DPMs have a single basic direction to take for personal survival.

Such job roles will have to change into a business systems management function where possible from the external marketplace, in order to provide an instant acceptable solution for line management users at far lower costs.

The average company's central DP budget is excessively high in relation to the facilities which could be bought in the external market by finance directors or chief accountants themselves, should they go out and shop around for facilities management or turnkey solutions.

Most development projects are now coming to an end, and if they are not curtailed as a result of adequate investment and forethought during the last decade, they are likely to be cut through lack of investment capital during the next two years.

We have identified a number of factors which too few companies are taking into account, and which perhaps pre-empt the extreme levels of change which our industry has not yet acknowledged.

Management in the US, unlike that in the UK, has for many years been prepared to accept a 90% instantaneous DP solution for only 20% of comparative development cost, and to enhance the peripheral aid with old program development or via external manpower support.

With significant advances in technology, by the time most companies ever get around to completing original systems development, their equipment will have become obsolete and will require changes to be made, which in turn can involve high software conversion costs.

Changing tastes

Such technology also has a direct effect upon the manufacturing capabilities of a growing number of companies as their own products or components become obsolete with changing market demands or tastes.

Therefore, as companies are progressively having to diversify into new markets, the control requirement of the

parent organisation from corporate level downwards will need to change pro rata.

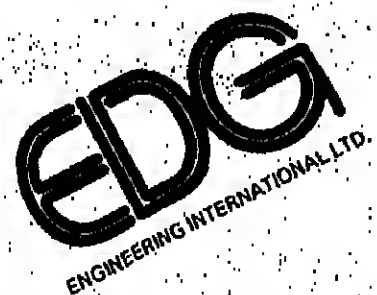
The argument could be put forward therefore that the future direction of the industry will primarily be to buy in a new control system at the same time as a new computer and accept the obsolescence of both over five years.

As most software vendors and producers will responsibly accept, the ultimate direction of primary software development towards a firmware marketing base is inevitable and the days of the average installation hierarchy are numbered.

Awareness

As user management has been forced to educate itself into the performance, cost and capability of DP aids, there has been a growing awareness relating to significant cost savings of acquiring an external package solution and enhancing the odd 10% where necessary in order to gain rapid benefits and significant cost savings. The days of custom building for a high percentage of the industry are rapidly drawing to a close.

The majority of companies have completed primary systems development and are themselves seeking distributed solutions via the software houses. The smaller companies are unlikely to be able to afford to continue operating in their present fashion as development organisations. The costs are prohibitive.



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The International Air Transport Association (IATA) has an immediate vacancy for an APL Programmer in its Geneva, Switzerland office.

Position: The successful candidate will become a member of a project team which is currently developing the "IATA Statistical Information System" on a Prime-650 computer. The development of this system will eventually consist of numerous statistical data collections relevant to the aviation industry.

Main Tasks:

- integration of these data collections into the system
- participation in the development of a data retrieval/manipulation language
- development of tailor-made programs according to user specifications

Qualifications:

- B.S. in Computer Science, statistics, mathematics or equivalent diploma
- 2-3 years' APL programming experience, preferably in a commercial environment
- fluency in English

Detailed Curriculum Vitae should be forwarded to:

Manager, Personnel

IATA

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TOP TURNKEY SALESMEN

EMS urgently need sales personnel with a proven track record capable of marketing a minimum £200,000 worth of new computer based systems inclusive of initial software revenues. We are at the present time involved in extensively marketing advanced and fully integrated on-line systems to the manufacturing, stockholding and distribution base throughout the UK, and urgently need highly motivated, experienced sales negotiators capable of assisting us rapidly expand our marketing activities during the coming year. Sales support will be given in the areas of extensive advertising, mail shooting, group seminars, occasional exhibition attendance and other special marketing techniques used in-house. We will in addition be seeking convincing experience and a level of salesmen capable of initiating relatively early business with a minimum of group supervision. We are only seeking proven and experienced negotiators who can become involved in a fast growing organisation and produce high personal sales based on individual merit. There are no cut-offs applied to sales earning levels and an opportunity for hardworking, conscientious salesmen is one not to be missed for candidates seeking to dramatically increase their own personal earning levels based upon results achieved. We have an extensive series of projects, quite dramatic, planned for a successful sales force during the 1980s. Contact us initially in the first instance for a meeting at our Birmingham Data Centre.

Telephone No.: 021-454 7905. John Wood or Diana Bosworth.

PROJECT MANAGERS/SYSTEMS DESIGNERS

The EMS Group are seeking additional experienced Project Managers capable of effective management and able to handle multiple projects to enable us to install an increasing number of turnkey systems during 1981. The company already has a significant base of on-line modularised software development and the majority of tasks will involve building enhancements to pre-established systems and both planning and controlling system testing prior to client installation for a wide variety of UK products. A sound systems design knowledge will be important as will the ability to undertake feasibility studies and prepare accurate systems specifications on client requirements throughout a wide range of industrial and commercial trading sectors. Sound business communication is important, as will be the ability to control staff and effectively motivate a team with sound leadership abilities. We seek candidates able to accept a degree of pressure working to tight deadlines in a number of systems volatile industries. We do not envisage candidates under 28 years of age having attained the relevant degree of manpower control experience. Salaries will be negotiable with the opportunity of acquiring a company car for relevant positions once candidates have proven their ability to perform satisfactorily at a Senior Project Manager level. We seek Managers capable of promoting and maintaining effectively designed systems in a disciplined and well-documented environment which will need their personal control and responsibility. We offer an interesting and varied range of projects, good future career development opportunities for key performers.

Telephone No.: 021-454 7905, Ian Gapper.

PROJECT MANAGERS

Pre Sales Support — Midlands — from £9,000 p.a. & car
EMS are expanding significantly in the Turnkey Systems sector during 1981 and onwards. Having made a substantial investment approaching £1 million already in the development of integrated on-line packages, we need experienced Systems and Business Analysts to assist the Sales campaign in the areas of Feasibility Studies, Tender Preparation, Package Demonstrations, Seminar Presentations, through to Post Installation Training and Support. We are seeking soundly experienced Analysts with a minimum 7 years' programming, preferably in Applications areas including Accounting, Stock, Purchasing Systems, Invoicing, Ledgers and Payroll. You must have personally controlled a team responsible for designing and installing at least 3 full systems during the last 2 years, or at least 2 major systems. Ability to correctly size jobs accurately, and to carry out detailed and accurate feasibility studies will be essential. Your projections are supported by the company's financial commitment. Professional competence is therefore essential. We turn out a very interesting and varied employment opportunity, involving negotiations covering the whole spectrum of industry and commerce, with on-going client contact at Board or Senior User level. These are positions enabling Project Managers to use the benefits of their experience to make a major contribution to a fast-expanding systems building group with some of the most advanced products in the industry. Some degree of mobility is important as a significant amount of commuting to client sites is involved with occasional overnight visits away from home, although naturally kept to low regularity levels. Sound presentation ability is important to accurately assess client requirements over and above our basic package facilities and to correctly size the relevant mini or micro configuration required to support the required system. Attractive salaries and career opportunities are available for the right candidates. We anticipate all candidates having progressed to a minimum £7,500 salary already before being ready to apply for these positions. With computer experience the would certainly be a useful attribute although not essential.

Contact Ian Gapper — Systems Development Manager.
Telephone No.: 021-454 7905

EXPERIENCED ICL 2903/4 ME28 COBOL PROGRAMMERS

Birmingham or North Staffs Positions — £8,500-£7,000 p.a.
EMS are developing an ICL Software Development Division based on in-house 2904 and remote 7602 equipment, providing client custom building and package development facilities. A wide variety of projects exist with staff needed in an almost constant development role. Vacancies exist both at our Birmingham Data Centre which has 7602 video control, Teletype line connection to the Head Office at Newcastle-under-Lyme, Staffs, and at the Head Office itself. Occasional daily travelling to client sites will be involved. Ability to work in a self-motivated project team will be important, as will the experience and commitment to achieve results within agreed time and date schedules. We are seeking candidates with at least 1 year's experience of ICL 2903 equipment to work at either centre. Apply initially to Patrick Cox, Programming Manager, or Beverly Proudman.
Telephone No.: 0782-623665.

PROGRAMMERS — COBOL, PL/1, ASSEMBLER, BASIC

Various UK Locations — to £6,000
EMS are seeking a number of experienced programmers for numerous installations throughout the UK, especially so for the Southern region at present. We need programmers for most major ranges of hardware, to work on mainframe and mini projects in a wide range of applications areas including on-line programming, TP and Database. Any experience of minis can also be especially useful as this is the fastest developing market of the 1980s. Irrespective of salary or location, complete the career form today. You will be at the forefront of opportunities in the 1980s which are never overestimated.
Contact Beverly Proudman.
Telephone No.: 0782-623665.

TURNKEY SALES MANAGEMENT

Midlands — Negotiable salary package. Board prospects
We urgently require a soundly experienced Sales Manager seeking the opportunity of joining a futuristic and dynamic Turnkey group, concentrating on supplying modularised software based systems to manufacturers, stockists and distributors. Additional vertical market products are nearing development completion including a car leasing and maintenance system, fresh food distribution systems through to electronics order processing and stock systems. A high degree of intellect and motivation will be required. Ideally the right candidate will be capable of recruiting and effectively controlling a sales team to aggressively market an advanced series of systems. A significant personal sales achievement will be expected during the first two years to help initiate a significant market penetration. The unit currently has 11 systems sold, most marketed at development sites by the group MD. The urgent requirement now is to recruit a Top Sales Manager with the ability to achieve a personal sales target of at least £250,000 a year whilst starting to develop a high level sales team of two staff during 1981, and further growth development upon results obtained. Numerous excellent marketing aids are available, far more prestigious than the average Sales Manager has ever had to back up sales campaigns before, including video film aids and publicity material. An excellent opportunity to progress within a fast expanding group now exists. Board prospects could be available ultimately for adequate equity and strong managerial control. This position will be Birmingham based in a modern control Data Centre. An attractive salary package is available with a sound career opportunity for a top productive manager. Progression will be singularly based upon results with a high dependence upon personal achievement during the next two years. Systems are based upon the very successful Honeywell Level 8 Series. No candidates under 28 years of age will be considered. A personal track record of achievement during the last 3 years will be sought, preferably with mini computer, or direct manufacturing system sales experience. Company cars are supplied.

Apply initially for application form: Diana Bosworth — 021-454 7905

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West London — to £8,000 p.a.
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Contact Colin Phillips — Contract Manager
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Analysts — Life Assurance — IBM — South Coast — 8-12 months.
IBM DOS Cobol — CICS Progs. — Berke — 9 months.
Honeywell IDS/TDS Progs. — Cobol — London or Home Counties — 6-12 months.
ICL New Range Analyst and Progs. — Cobol VME — London or H. Counties — 6-18 months.
IBM Cobol Progs. — South Coast — 3-4 months.
Honeywell Cobol Progs. — IDS/TDS — London or Home Counties — 8-12 months.
CNC Reality Progs. — Basic — Somerset — 8 months.
DEC PDP Progs. — Basic — Kent — 3 months.
IBM Cobol Progs. — DOS/VS — OLI preferred — Essex — 8 months.
IBM Systems Progs. — Assembler — Cobol — CICS — Essex — 3-6 months.
IBM Progs. — OS — PL/1 — CICS — Kent — 8 months.
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ICL New Range Progs. — Cobol — VME — London or Home Counties — 8-12 months.
Progs. — Fortran — Degree 1st (Maths/Physics) — London — 8 months.
IBM OS/VS1 — Cobol — Progs. — Min. 5 years' experience — South East — 8 months.

Midlands
ICL Cobol 1900 Progs. — George III — Crews, Cheshire — 8 months.
PL/1 Progs. — IMS/DB/DC — Birmingham — 6-12 months.
DEC Macro 11 RTL — 2 Progs. — Birmingham — 6-12 months.
Honeywell Level 84 Cobol Progs. — Birmingham — 6-12 months.
Honeywell L8 and Series 88 — Systems Progs. — Network — 12 months.
IBM Cobol OS/DOS — OLI 1 advanced — various Midlands — 8-16 months.
IBM Progs. — PL/1 — IMS — OS/DC — 8 months.
ICL 2900 Cobol Progs. — VME — 8 months.
Honeywell Level 8 Progs. — TPS — Birmingham — 6-12 months.
Honeywell Level 84/88 Cobol Progs. — IDS/TDS — Birmingham — 6-12 months.
Univac 1100 Cobol Progs. — Birmingham — 8-12 months.

Northern
ICL 1900 Cobol Progs. — Filetab — Manchester — 6-12 months.
Honeywell L88 KOB/TOS Cobol Progs. — Liverpool — 6-12 months.
Numerical Analysts — Commercial Systems — Liverpool — 1-3 years.
IBM DOS/VS Cobol Progs. — CICS OLI/1 — Manchester — 1-3 years.
ICL 2900 VME Systems Programmer — CICS OLI/1 — Manchester — 6 months.
IBM Assembler Programmer — Liverpool — 8 months.
ICL 2900 Cobol Programmer OME — Hull — 8 months.
IBM Cobol Progs. — CICS — Teeside — 8 months.
IBM Progs. — MVS — Assembler — Payroll — Sheffield — 6 months.
IBM Cobol Progs. — CICS — Merseyside — 8 months.
IBM DOS/VS Cobol Progs. — Progs. — CICS — OLI/1 — Manchester — 12 months.
IBM Systems Progs. — MVS — IMS — Manchester — 3-6 months.
Univac Progs. — Exec 8 — Assembler — Fortran — Manchester — 3-6 months.
Honeywell L88 Progs. — IDS/TOS preferred — Manchester — 8 months.
Univac Software Progs. — Assembler — Fortran — Manchester — 6 months.
IBM PL/1 Progs. — Various — 3-12 months.
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		Ext.	
Post Code	Date of Birth	Place of Birth	Nationality
Age			Height
			Weight
Married	Children	Car Owner	Driver
		Nature of any Serious Illness	
Position Required		Required Salary Range	
Present Position		Salary	
WHERE DO YOU WISH TO WORK			
Within U.K.	Yes/No	Acceptable Areas	Abroad
Will you move	Yes/No	Europe	Yes/No
		Middle East	Yes/No
NUMBER OF YEARS EXPERIENCE			
Operating	Programming	Systems Design	Systems Analysis
		Management	Total
Available for Interviews			
Available for Employment			
DETAILS OF SECONDARY AND FURTHER EDUCATION			
Schools	Date	Examinations Passed	
College/University	Date	Examinations Passed	
Business Courses with Dates			
1. Present Employer			
Position		Town	
		Date Joined	
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	
2. Previous Employer			
Position		Town	
		Date Joined	
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN			
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Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	

Revision to Seeking Change			
Detailed type of position wanted			
Additional Information			
Please explain below, in at least 10 lines, your current duties and applications experience			
FOREIGN LANGUAGES			
Spoken	Written	Read	
Please show the number of years experience of the following. Where your experience is not specified please use the blank spaces			
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IBM 360/370	DDS	CDBOL	FILETAB
ICL 1900	OS	FORTRAN	DRIVER
ICL 2960/2970	MVT MFT	ASSEMBLER	CICS
ICL 2903	GEORGE 1	PLAN	IMS
UNIVAC 1100	GEORGE 2	PL1	BOMB
UNIVAC other	GEORGE 3	RPQ 2	D BOMB
BURROUGHS 700-800	MCP	USERCODE	PERT
BURROUGHS other	Exec 8	AUTOCODE	V SAM
HONEYWELL 66	GCOS	EASYCODER	IOS/TOS
HONEYWELL 6000	DS 2000/200	ALDOL	MICROFILMING
HONEYWELL other	VMEB-VMEK	NEAT	TELEPROCESSING
NCR	J Level	CORAL	OMS
ICL System 4		DL1	
POP			
3. Past Employer			
Position		Town	
		Date Joined	
TYPE OF INSTALLATION			
Commercial	Bureau	Insurance	Scientific
Manufacturing	Banking	Education	Engineering
HARDWARE		OPERATING SYSTEM	
		LANGUAGES	
Software or Packages			
On-Line	Real Time	Time Sharing	
R.J.E.	Tele Processing	Data Base	
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN			
Cost Accounting	General Ledger	Manpower Planning	Personnel
Budgeting	Credit Control	Stock Control	Payroll
Forecasting	Order Processing	Production Control	O.R.
Corporate Planning	Marketing	Petrochemicals	Radar
Sales Ledger	Distribution	Linear Programming	Statistics
Purchase Ledger	Traffic Analysis	Simulation	
Projects Completed		Responsibilities	
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ADDITIONAL INFORMATION			
General			
Data Processing			
Terminal			
Software/Packages			
Application Areas			
Projects and Responsibilities			

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If you're a data processing person, ambitious, able to talk intelligently, listen, and make sound judgements, you will find the career progression and financial rewards we offer are exceptional.

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Expansion of this renowned manufacturer of sophisticated data communications products has created an exciting opportunity for an ambitious sales engineer in the North.

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Recruitment LOGISTIX In Informatics

A.T.E. Software London and Home Counties Salary to £10K

Real-Time Programmers with at least two years' experience are urgently required by a rapidly expanding supplier of Automatic Test Equipment. In this, one of the fastest growing areas of the Data Processing Industry, our clients have an outstanding reputation and supply both the commercial and defence sectors of the market. Particular hardware experience is not a requirement but fluency in Assembler, CORAL 86, ALGOL or derivative languages is essential. Applicants familiar with Fairchild, Fluke, Genrad or Membrain systems will be especially welcome. Ref: L/49/A

Communications Software W. Germany: Pkg. to £18K

An established world leader in telecommunications products is seeking to recruit Communications Software Specialists to join existing project teams at its R & D Headquarters in Southern Germany. At least two years' experience in the design and development of specialised software for FAX or FAX systems is essential. Applicants who are also able to demonstrate a knowledge of digital hardware concepts will be particularly welcome, as will those with experience of programming around Intel 8085/8 microprocessors. Successful candidates will, in addition to a competitive salary, receive relocation expenses and an attractive benefits package. Ref: L/49/B

Software Manager London: Salary to £10K

A leading British Microcomputer Manufacturer is seeking to recruit a Software Manager to provide software implementation and customer support services for their excellent product range. Candidates should be familiar with current microprocessor and microcomputer technology and in addition be conversant with marketing and sales techniques. It is preferable to have had exposure to both the hardware and software of such products as Apple, Pet, Commodore, Horizon and the wider range of small business machines currently available. Work content will include software problem solving, customer liaison, presentations and training. This position will appeal to a career-minded individual with a desire to progress into management. Ref: L/49/C

Analyst/Programmers Central London: Salary to £9K

A leading British Systems and Software Consultancy renowned for its development and implementation of commercially orientated systems currently requires additional Analyst/Programmers. Applications are invited from ambitious, career-minded individuals with the ability to liaise with clients at all levels. You should have a minimum of 18 months' programming experience and be familiar with commercial applications, e.g. Banking, Insurance, Stock Control, Order Entry and/or Accountancy. Whilst it is not necessary to have exposure to any particular hardware, the company does have a stated preference for candidates with experience of DEC's PDP range. Interviews will be held in London within the next 14 days. Ref: L/49/D

Real-Time Applications Holland: Salary to £16K

The rapid growth of the Dutch division of an international renowned systems and software house has led to a requirement for additional Consultants, Team Leaders, Analysts and Programmers. Suitable applicants will probably be numerate graduates who have at least one year's real-time programming experience on any mini or microcomputer. In-depth knowledge of Assembler language is essential for all positions and of particular interest will be candidates who have specialist expertise in the field of Communications, Networks, Message Switching or Process Control. As a member of a small project team you will be involved in all stages of the design of a system through to the implementation and obviously liaise continuously with the client. Ref: L/49/E

Project Development Engrs. Thames Valley: Salary to £10K

A leading minicomputer manufacturer having its Head Office in the Thames Valley is seeking several Development and Project Engineers as project team members within the Company's Product Development Unit. All applicants should preferably have an academic background in Electronics or Computer Sciences. These positions contain a high degree of digital circuit design and logic design whilst a thorough understanding of software techniques is essential. A knowledge of Assembler language gained with either a Manufacturer or Systems/Software House environment will reflect in the salary offered. For certain positions, where customer liaison is necessary, personal communication skills will be highly rewarded. Ref: L/49/F

Mini/Micro S-W Development Beds./Bucks.: Salary to £10K

Our clients' Research Laboratories are located in a most attractive South Midlands town. Current requirements are for Development Programmers and Software Engineers offering a minimum of two years' Assembler or Basic programming experience on any minicomputer or microprocessor. These positions will appeal equally to those with a scientific/academic computing background or commercially inclined programmers. Unrivalled development aids on the company's recently upgraded hardware are available for ambitious, career-minded individuals. The salary and excellent ancillary benefits represent an outstanding opportunity for those keen to participate in 'state-of-the-art' software and firmware projects. Interviews can be arranged both locally and in London. Ref: L/49/G

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063 LOGISTIX Telex: 28800

METROPOLITAN BOROUGH OF SEFTON FINANCE DEPARTMENT COMPUTER SERVICES DIVISION

JUNIOR PROGRAMMERS AP2/4 - 4509/6837

Applications are invited for the above posts from trained Cobol programmers, preferably with knowledge of I.C.L. Software. Although practical experience is desirable, consideration will be given to applicants who have completed HND or other full time computer courses, or will do so in the near future. Starting salary will be fixed in accordance with experience and qualifications.

A wide range of local government applications are currently based on an I.C.L. 1903T Computer, some on-line inquiry systems are in use and on-line cash receipting equipment is being installed.

National conditions of service for A.P.T. and C. services apply and the Authority operates a 35-hour week.

Applicants giving details of age, experience and qualifications together with the names and addresses of two referees should be sent to the Chief Finance Officer, Metropolitan Borough of Sefton, P.O. Box 18, Balliol House, Stanley Precinct, Bootle, Merseyside L20 3NQ not later than 15th December, 1980.

Concave will disqualify and applicants must declare whether they are related to any member of the council or senior officer of the Authority.

(3013)

The Queen's University of Belfast SENIOR SYSTEMS ANALYST Department of Community Medicine

The Senior Systems Analyst will manage the Department's multi-access computer system based on a PDP 11/24 processor running under RSX-11M. In addition the analyst will be responsible for developing additional medical software and will advise the Department on future hardware and software strategies. A data link to the University's main computer centre is available. Candidates must have extensive computer programming experience in Fortran and a knowledge of SPSS, preferably in a PDP-11 environment. Salary scale (under review): £222-£1187. Further details and application forms are available from the Personnel Officer, The Queen's University of Belfast, Belfast, BT7 1NN, Northern Ireland. Please quote Ref: R/20V.

(3701)

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY PROGRAMMER

Applications are invited for a post as Programmer in the Department of Civil Engineering involving the development of computer programs for a wide variety of applications. These are mainly from research activities within the Department. A selection of the duties to be performed will be: to develop and maintain software for the design and analysis of structures, and to develop and maintain software for the design and analysis of structures. Salary scale: £4785-£9095 (under review). It is hoped to appoint within the next half of the year. Further details and application forms from Paul Johnson, Establishments Officer, Ref: R/20V.

(3778)

William Key

A selection of our Key vacancies:

6 years' + IBM Cobol experience is needed by this company which currently has 2 x 370/145s with 2 x 4341s on order. Ref: TA/1

SYSTEMS ANALYSTS CITY to £10,000
2 years' + commercial experience for IBM 3033 installation. Ref: TA/2

SYSTEMS PROGRAMMER CITY to £10,500
2 years' + MVS experience is needed for this IBM 3033 installation. Ref: TA/3

SENIOR PROGRAMMERS CITY to £12,000
Sound PL/1 or Assembler experience for IBM 370/145 and 155 user. Ref: TA/4

SYSTEMS PROGRAMMER ESSEX to £11,500
With 3 years' + DOS VS CICS experience. Hardware is IBM 370/135. Ref: TA/5

SRIL SYSTEMS ANALYST NORTH LONDON to £10,750
'With 5 years' + systems experience (including on-line) for IBM 370/145. A 4341 will be installed shortly. Ref: TA/6

CHIEF PROGRAMMER DESIGNATE MIDDLESEX to £10,000
4 years' + IBM Cobol experience for an IBM 370/135 installation. Ref: TA/7

FREELANCE SYSTEMS DESIGNER LONDON to £500 per week
'Real-time systems design experience for Intel 8085/86 installation. Ref: TA/8

For details of these and many other opportunities ring Tim Armistead on 01-493 2947 (office hours) or Epsom 25384 (evenings and weekends).

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1 Shoptersway Park, Berkhamsted, Herts
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(3780)

REAL TIME SOFTWARE

HARROGATE £5,085 p.a. - £10,600 p.a.

Applications are invited for the post of Research Officer within the Control and Instrumentation Division of the Regional Scientific Services Department, based at Harrogate.

The successful candidate will join a group which is actively engaged in developing real time systems software for hierarchical distributed micro and mini computer systems, to be used for on-line data acquisition, display, monitoring and control of modern generating plant. Applicants should preferably be in their twenties and have a good degree in computing science or equivalent qualifications. Experience with CORAL 86 and familiarity with PDP 11/15 11 H33 I/P are an advantage but not essential. The salary scale is £5,085 p.a. to £10,600 p.a. Further information, if required, is available by telephoning Harrogate 702859. Please quote the reference number 8VN/426/K/A on your application.

Central Electricity Generating Board - North Eastern Region

(3770)

Travicom 2

The Travicom System is the world's foremost multiple access airline reservations, ticketing and accounting system. Some 500 United Kingdom travel agents already have direct visual display connection to the seat booking processors of 20 leading international airlines for these purposes. The Travicom 2 System now being developed at Maidenhair will retain the world lead by increasing several-fold the power available for message switching and translation. It will operate with Packet Switched Services or with Dedicated Data Networks and will extend the range of services to include package tour, hotel, car, rental, sea ferry and rail booking, ticketing and accounting.

KLM have chosen the Travicom 2 System for use throughout Holland. Other airlines and telecommunications authorities are about to do so for their countries. If you are an experienced programmer or software engineer familiar with any of the following: * DEC or Zilog hardware * Data Communications, Accounting or Commercial systems * RSX-11 operating systems * Conic Assembler, Micro-Cobol language and are interested in joining an expanding and exciting project with opportunities to travel and work abroad please contact us for more information.

Telephone Personnel Department, Maidenhair (0628) 71511, Ext. 42, or write to Computer Communications Limited, Fleming House, 100 King Street, Maidenhair, Berkshire MK44 0LQ.

(3771)

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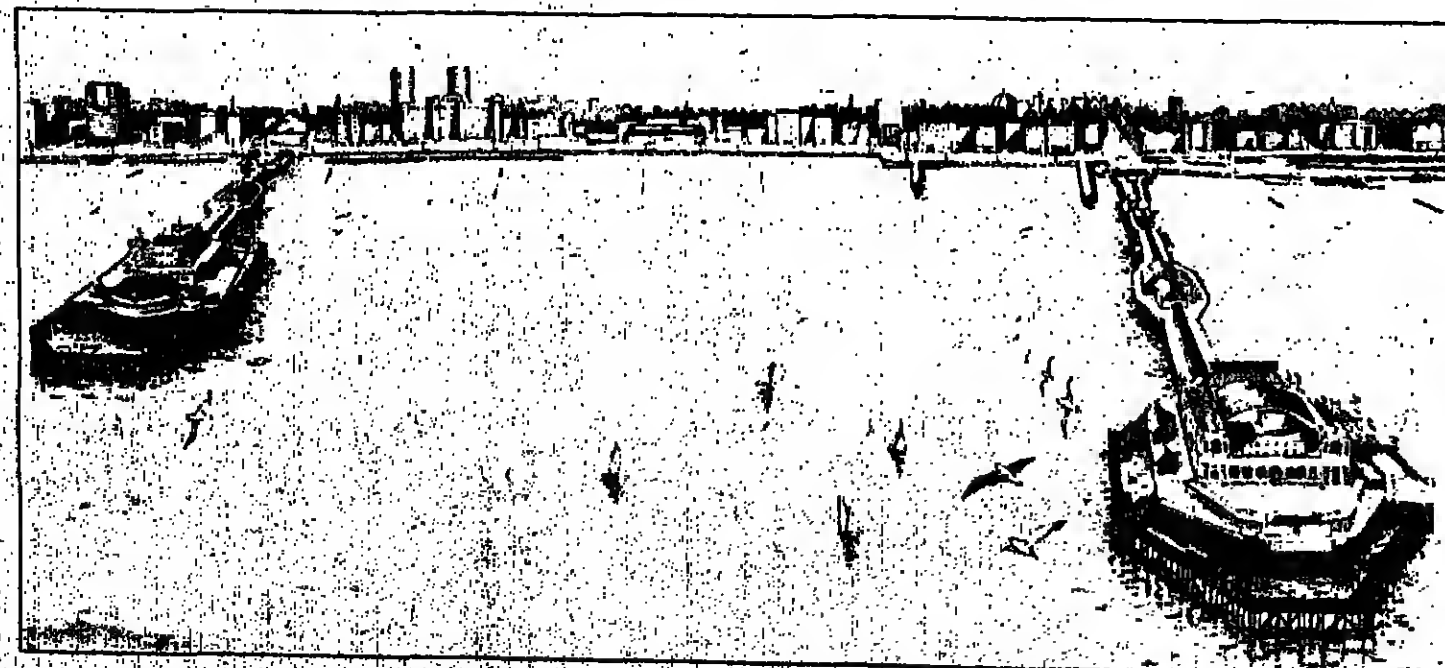


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SCRL
Specialist Computer Recruitment Ltd

(3814)

JOBS WITHOUT PEER IN A TOWN WITH TWO PIERS



With the ever changing technology in the telecommunication field, we at ITT Creed Limited, part of ITT Business Systems Group, want to expand our Software Department which will be embarking on a new project early in 1981.

As a result, there is a need for EXPERIENCED SOFTWARE SYSTEMS DESIGNERS to join our team at the design stage of the project. It is your chance to be in at its birth and work through to a position of team leader during the implementing and testing phases of the product. One of these senior people will be based towards the quality control and testing aspects of the project.

If you have had several years' experience in Software Systems Design and have specific knowledge in any of the following, we would like to hear from you:

- Embedded operating systems
- Text editing or word processing type applications
- Communications, line handling, networking, protocols
- Software development for Microprocessor target H/W

Our development facilities are based around a PDP11/70 running the UNIX operating system.

These positions may involve some international travel to liaise with our sister company. You will receive a competitive salary and the prospects for a talented designer are very bright. Some of the many benefits offered include 25 days holiday and a generous relocation package if it is necessary to move to the Brighton area, which in itself is a bonus.

Please send full career details to Mr. Ray Hooker, ITT Creed Limited, Crownhurst Road, Hollingbury Industrial Estate, Brighton, Sussex, or telephone Brighton (0273) 607111 Ext. 3614 for an application form. (Answering service after office hours is available).

ITT Creed Limited

Our Client is an established International leader in the information services industry providing total business/decision support systems. They are notably successful, turnover \$1 billion, are one of the top R&D investors in the United States. Their innovative products are envied by competitors.

After training in the United States you will work from their superb London offices where you will be fully supported by a dedicated team of professionals.

Real career prospects, unique products, personal environment, excellent earnings package, supported systems. These are the ingredients the Company offers giving you every opportunity for a successful and long term investment.

As a guide, you should be successfully selling within the computer industry. If you are selling systems or on-line services all the better, though consideration will be given to all candidates.

If you wish to work for a Company that claims computer know how and creative audacity; enthusiasm coupled with sound and tested fiscal policies; and a sense of mission which is applied to the needs of business and industry, your next step should be a logical one.

For an immediate and totally confidential interview contact:
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or 021-420 1574 (evenings & weekends).

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Your application will be treated in strict confidence.
Please write to me if you prefer.

Will you be part of Europe's most advanced custom IC design facility?

At the Wembley site of Marconi Electronic Devices Limited, we're creating what will be the most advanced VLSI design facility in Europe — a centre dedicated to the production of specialist micro devices for a wide range of customer industries.

Device design is supported by extensive computer aided design systems based on Applcon Graphics Systems, GEC 4000 Multi-access System and the powerful VAX 11/780. Because of the continued growth in demand we now have the following opportunities for men and women, all of which are new positions:

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With strong Fortran and machine code experience, to work closely with logic and layout designers on a wide range of specialist software. We're looking for effective and open-minded problem solvers.

Salaries will be negotiable and extremely competitive and will be enhanced by a top line benefits package, with relocation expenses paid where applicable.

If you feel that you could provide the quality of support we're seeking, please write with brief career and personal details to: Mrs. K. Morton, Personnel Officer,

Marconi Electronics Devices Limited
East Lane, Wembley, Middlesex HA9 7PP, or telephone 01-908 4111

(3801)

who have the ability to keep up with the ever-increasing complexity of micro device design. Applicants should be of graduate calibre with a heavy electronics background and at least 2 years' CAD experience.

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This is a demanding role calling for first-class administration skills. The prime task will be to maximise designer access through the efficient scheduling and smooth running of computer facilities and the maintenance of an effective archiving service. Applicants should have a good operations background and could well be shift leaders looking for a career step upwards into a dynamic and highly successful organisation.

DP Team to set up a New Management Information System

To cope with the increasing Management Information requirements brought about by company expansion an engineering company situated in the North of London is establishing a new department. The new system will cover such functions as stock control, sales information, budget labour control, production, purchasing and accounting. There will, therefore, be considerable scope for suitably qualified men and women, with good business systems experience. Immediate requirements are for:-

Systems Analysts

Senior Analysts and Analysts are required with sound experience of manufacturing and production techniques and finance. Administrative ability is essential, particularly for the senior positions, and a knowledge of COBOL is desirable.

Programmers

Senior Programmers and Programmers are required with experience preferably in a MIS environment using COBOL. Experience of CIMCOM's TOTAL database management systems would be desirable. Applicants without TOTAL and COBOL experience will be considered, as training can be given.

All positions carry attractive salaries and benefits including assistance with relocation, where appropriate.

Write with details of experience to Position Number AMD 8086, Austin Knight Limited, London W1A 1DS. Applications are forwarded to the client concerned therefore companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor.



Austin
Knight
Advertising

Metropolitan Borough of Rochdale

AN EQUAL OPPORTUNITY EMPLOYER
TREASURER'S DEPARTMENT.

TECHNICAL SUPPORT PROGRAMMER

A.P.S.O. 1 £8,750/£7,895 (from April 1981) £6,570/£5,130.

Rochdale is currently implementing VME/K to run on its 2860 Mainframe. Conversion work will be put to a minimum by re-designing older systems. New developments are also planned.

Applications are invited from Programmers having a minimum of 2 years' experience. VME/K training will be given as necessary.

Application forms and further details are obtainable (by sending ref. E317) from the Chief Personnel Officer, P.O. Box 88, Municipal Offices, Smith Street, Rochdale, OL16 1XG (telephone Rochdale 47474, Ext. 652), to be received not later than Thursday, December 18, 1980.

ROBOTICS PROGRAMMER

We need a bright Programmer/Engineer to join our team on research, development and maintenance of Robot Control Systems software. Should have some experience in Assembly Language programming of Microprocessors or Microcomputers. Would suit younger person willing to learn and develop with the company.



Communications salary.
Contact Max Parker at
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(0923) 39422. (0775)

ANALYST/PROGRAMMERS

London IBM Cobol/PL1/Mark IV

Tel: Roger Barnes on 01-628 4200.
485 Copthall Avenue, EC2R 7DA
(0121) 31221

If you're on form... ...fill in this one.

If you're performing really well in your present job, you'll be keeping your eyes open for something better. But being a top performer, you've got better things to do with your time than pore over pages of job ads and make dozens of phone calls. So to save time, and to get yourself lined up for some of the best jobs going, just fill in our application form. We'll then get back to you fast with details of jobs that are exactly right for you.

Personal

Please write in ballpoint, using block capitals.
Surname _____ Forenames _____ Mr/Ms
Address _____

Tel. Home _____ Office (if different will be used) _____
Age _____ Nationality _____ Car? _____
Are you prepared to relocate in UK? ☐ Abroad? ☐ (tick box)

Experience

Place no. of years in box, e.g. IBM 360/370

Machines:

Please specify model.
IBM 360/370
IBM others (specify)
ICL 1900/2900
ICL others (specify)
Honeywell
Univac
Burroughs
PDP
Other mainframes
Other mini-computers (specify)

Languages

Cobol
Plon
Assembler
PL/I
Fortran
Filetab
RPGII
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Others (specify)

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DCS
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Position Sought

Please state briefly the type of appointment you are seeking.

Contract? ☐ Permanent? ☐ Either? ☐ (tick box)
Minimum salary £ _____ Notice required/Date available _____
Signed _____ Date _____

Cut out the whole advertisement and post to the address below.

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(3118)

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For people with at least 4 years experience in computing and an interest in developing such current technology as micro-computer data capture in the implementation and design of highly sophisticated telecommunication networks, Ladbrokes Racing have got exactly what you're looking for.

They are looking for someone with proven computing ability and knowledge of telecommunication network design to help them in the design and development of highly advanced, original technologies relating to telecommunications and data capture.

The work is stimulating, remunerative and benefits excellent and career prospects are outstanding.

If you have what it takes and can liaise competently with all levels of management, Ladbrokes Racing would like you to contact them.

Just write to Mrs. Marjorie Cobham, Ladbrokes Racing Ltd., Hanover House, Lyon Road, Harrow, Middx.

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SYSTEMS PROGRAMMING MANAGER

Cambridge £14,000+
Applications should be from 5-7 years' experience in a technical IBM environment with good supervisory skills to level 7 users. The company uses an IBM 3031 + OCS 20 computer. Experience of MVS, JES and ISD essential.

SYSTEMS PROGRAMMERS

Cambridge To £10,000
The company has a medium sized installation, using IBM hardware under MVS 370 and OCS/VS8 with CICS/VS and DL/1. If you have at least 2 years' relevant experience for this position and/or any other preferred location, we would like to hear from you.

SYSTEMS ANALYSTS

Cambridge £7,000-£9,000
Various computer systems analysis with 10 months' to 3 years' experience in systems analysis.

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Cambridge and Basingstoke £6,000-£8,000
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AMES PERSONNEL

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We have several projects currently in London and the Home Counties with immediate starts for 3-12 months' duration.

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Six month contract starting January in Western Home Counties location.

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We have various projects starting within the next 6 weeks for good JSP Pre-processor experienced personnel.

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We are looking for an experienced COBOL Analyst/Programmer with in-depth knowledge of TIP for initial 6 month contract.

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Inventory control experience essential for 12 month contract.

ICL 2900 VME/B ANALYST

Immediate start for initial 4 month contract.

IBM OS COBOL PROGRAMMERS

January start for initial 3 month contracts in West London.

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January start for experienced VME/B personnel. Initial 3 month contract.

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Several vacancies to work on Parsons System starting January.

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Immediate start for 6 month contract. All levels of personnel required.

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Immediate start for 8 month contract; also requirements for next year.

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To join these teams operating a shift system covering Monday to Saturday (34 hour, average four day week) you should be aged over 19 years, with a minimum of 1 year's experience on ICL 1900 or 2900 series.

You can expect to earn up to £6,500. Inclusive of shift allowance. Benefits include relocation expenses, house purchase scheme, four weeks' annual holiday, non-contributory pension, free life assurance, luncheon vouchers, 24 hour staff restaurant etc.

For further details and an application form telephone Mrs. R. Siddons on 01-952 2333, or write to her at:

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Salary £9411-£10842 p.a.

CAN YOU HANDLE AN ON-LINE SYSTEM?

Thames Valley Police are looking for an experienced Senior Programmer to perform development and maintenance work on a computer on-line system. A challenging series of extensions to this system and to associated IOS batch programmes is envisaged.

The successful applicant will have extensive COBOL experience on an on-line system, preferably but not exclusively with Honeywell 8000/Level 68 using IOS and TOS. He/she must be willing to take an increasing interest in the maintenance of existing software, and development of future systems, and be capable of working on their own and to rigid standards. He/she will also have the ability to communicate at all levels and to instruct staff in the basic systems.

Over four weeks' holiday, pension scheme, assistance towards removal expenses.

Application form and further particulars from: The Principal Personnel Officer, Thames Valley Police Headquarters, Kidlington, Oxfordshire, OX5 2NX (Telephone Kidlington 4343, ext. 287).



TREASURER'S DEPARTMENT ASSISTANT COUNTY TREASURER (COMPUTER SERVICES)

Grade: PO2 (c. £11,822-£12,714 per annum)
Applicants must have considerable experience in the control, management and operation of large scale data processing activities.

The computer installation consists of an ICL 2980 with 2 Mb store, exchangeable disc storage, and communication facilities providing an RPL service operating under OME. In addition to the wide range of financial and non-financial applications operated for the Department and the County Council and the District Police Authority, facilities are also provided for the six District Councils of the Area.

The Officer appointed will lead a section of 32 staff and will be expected to make a positive management contribution to the work of the County Treasurer's Department and to extensive future system development. Applications from the Director of Personnel and Management Services, County Hall, Carmarthen.

CANVASSING DIRECTLY OR INDIRECTLY WILL BE QUALIFY

SENIOR PROGRAMMERS

We require Senior Programmers for contracts in North-West, with a minimum of 2 years' experience in PASCAL or COBOL plus a good knowledge of POP11 systems. Good promotional prospects.

Apply to: Mr. T. Ludington, I.S.D. LTD., 100, St. James' Street, London SW1A 1JL

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Finding answers really isn't too difficult, it's developing the solutions that takes the skill. And when you design and develop applied electronics systems for military and civil applications, those solutions are complex.

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So as a Software Engineer with us, you'd be assured of plenty of challenge.

After all, one of our current projects, the real-time software for Nimrod AEW Mk. 3 is the most technically advanced system of its kind in the world.

And because our software engineers work in small teams, each of which is responsible for the design of a specific aspect of a system, from inception to implementation, you'd also be

assured of plenty of scope for your ideas.

Surprisingly, perhaps, many of our most successful people come to us without any knowledge of avionics.

But whether or not they know our field, one thing that each of these men and women has in common is a commitment to excellence gained in data processing and programming.

Something we recognise and reward with a salary, career prospects and other benefits that are the hallmark of the professional.

And Chris Hill on 01-953 2030 ext. 3449 would like to tell you more. Once he has, we think you will want to become part of the Marconi team right away. Alternatively telephone 01-207 3455 anytime day or night.

If a telephone call is inconvenient, you can always write to us, with details of your career, at: Marconi Avionics Limited, Elstree Way, Borehamwood, Hertfordshire, WD6 1BR. Please quote reference MA 80/53.

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Project Leader — c. £8000 — £11,600

This new appointment, reporting to the Computer Development Manager, involves active participation in development projects at all stages from feasibility study to implementation including systems analysis and design, project planning and project leading.

Systems Analyst/Programmers — Salary Range £6000 — £8000

Activities include system and program specification, program design, writing, testing, implementation and support, assisting in user training and liaison with project and user management.

BOCM SILCOCK

Alan Coates, Staff Personnel Manager, BOCM SILCOCK LTD., Basing View, Basingstoke, Hants. Tel: Basingstoke 29211, Ext. 378.

COMMS SOFTWARE

Designers and Programmers wanted by Berkshire-based supplier of Comms Systems. Expertise in X25, operating systems, Pascal and Assembler urgently required for new and existing project teams.

£7-11K

PL/1

Programmers and Analysts with strong PL/1 programming background. Ideally with DB/TP or other specialist IBM knowledge, required for UK, European and Middle East assignments operated by British Systems House, London interviews.

£6-8K

HOLLAND

Programmers (3+ years). Analysts and Designers with experience of Macro 11 under REX-11M, GC/Init or T1 Assembler required for scientific/technical projects currently being operated by UK Systems House overseas.

£13-18K

SNR PROGRAMMER HERTS

Senior Programmer required by large IBM and Mini user for newly-created technical support role — experience of CICS, DL/1 and JSP desirable. Responsibilities include involvement in Systems Design, standards, etc. Large company benefits apply.

c. £8K

GERMANY IBM

Analysts and Programmers wanted to work on IBM compatible systems at European division of leading Computer Systems Manufacturer. The requirement is for Assembler, TSO and DB/DC experience. Relocation assistance and excellent benefits package.

£12-18K

FRANCE COBOL

IBM COBOL and PL/1, minimum 4 years' experience with knowledge of IMS, DL/1, CICS a considerable advantage. Wanted for projects being operated by British Systems House in France. Relocation offered.

to £18K

PROCESS CONTROL

Programmers and Analysts with 3+ years' mini or micro Assembler (OEC in particular) experience plus relevant (i.e. scientific) degree required for producer of Industrial Control and Automation Systems. Offices in Herts.

£7-10K

2900 VME/B

Analyst/Programmers and Analysts, COBOL programming in a back-ground, required for new project being undertaken by Systems House in Central London. 2 or more years' experience in large ICL 2900s under VME/B required.

to £12K

MIDDX - COBOL

Programmers, Analysts and Team Leaders with COBOL experience and, ideally, some knowledge of structured programming techniques, required to meet expansion plans for development centre of leading manufacturer. Degree preferred, no specific IT/W background but commercial/financial applications experience necessary.

to £10K

MACRO 11

Programmers and Analyst/Programmers with 2+ years' Macro 11 wanted to join young but rapidly growing Software House. Projects are technical, scientific and military, so knowledge of CORAL, Fortran etc. is an advantage. Offices in London, projects in diverse locations.

to £10K



10 Grenville Place
London SW7 4RW
01-373 3063

to 8.30pm 7 days a week

COMPUTER WEEKLY CHRISTMAS PUBLISHING ARRANGEMENTS

In view of the Christmas holiday the December 11th and 18th issues of Computer Weekly are being combined and published on December 11. The December 25 issue will not be published.

Classified copy for the January 1, 1981 issue should arrive no later than 10 a.m. Tuesday, December 23.

COMPUTER WEEKLY

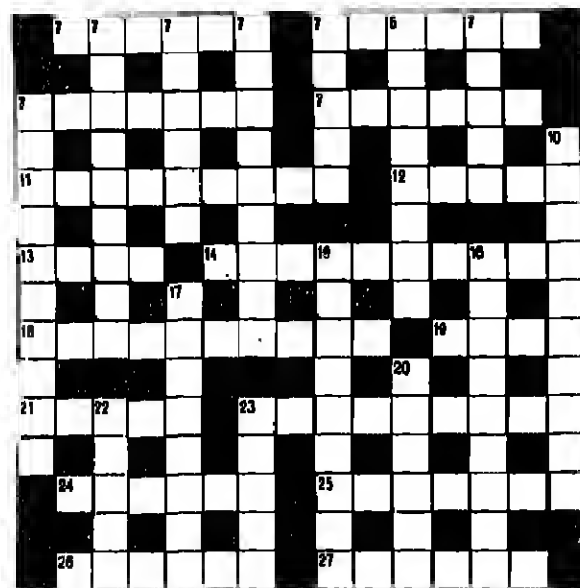
Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS
Tel: 01-661 0121

01-661 0121

CW Prize Crossword 11

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, by first post, Friday, December 12. Please use a ballpoint pen to complete the crossword.



ACROSS DOWN

1. Backward bachelor taken into employment and revived (6)
2. Tosses, we hear, with violent pangs (6)
3. Skole, perhaps, round pool with no front piece? That's unwise (7)
4. Unassuming, kind and good man (6)
5. 11, 12. Deciphered, like errors in a closing-down sale? (7, 2, 5)
6. A small number live in retirement - it's dark and very hard (4)
7. Suppliers of light vessel lead astray the feminine supporter (10)
8. Lively dance causes a storm - tell one about it (10)
9. Something curvaceous - my goodness! (4)
10. 21, 23. Where you'll find no old copper asleep? (2, 3, 4, 2, 3)
11. Clank that's masculine, not scooped out inside (6)
12. Love, receiving allowance, gives formal address (7)
13. Long to embrace listener, beloved one (6)
14. Channel, initially tranquil, but getting turbulent (6)
15. Mental institution, extensive, with space all taken up (9)
16. The cane's a change from the usual procedure (6)
17. A dry, awfully dry and heated (9)
18. Assembled up above the river in time (5)
19. Detective branch I set up in control causes decision (8)
20. A portion of golden sweet-pudding's to follow (5)
21. The police train a bit oddly? Definitely (3, 7)
22. Prepare for battle, old fellow, the final battle (10)
23. Making about a pound abroad; dealing sparingly (6, 3)
24. Pray for unlimited period at the wicket, being an opener (9)
25. Rambling rose - can't get one high up in the tree? (6)
26. A vegetable too apt to get mashed (6)
27. Find whereabouts of overturned eastern vehicle (5)
28. Loyal subject, for example, detected in falsehood (5)

RULES AND CONDITIONS

1. Each competitor may submit no more than one entry.
2. The competition is open to all readers of Computer Weekly.
3. The competition will close at the end of the week of 1st December 1981.
4. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.

ROBOTICS PROGRAMMER

We need a bright Programmer/Engineer to join our team in research, development and maintenance of Robot Control Systems software. Should have some experience in Assembly Language programming of Microprocessors or Minicomputers. Would suit younger person willing to learn and develop with the company.

HA
A GEC Marconi Engineering Company.
Contact: Max Parker or
Ruth Ashdown, HALL
ROBOTICS LTD., COLONIAL
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(0923) 584522. (2778)

ANALYST/PROGRAMMERS
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Must have experience on PDP 11/70 and/or RSX 11/M.
Excellent salary + company benefits. Urgent requirement.
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Our client is an established supplier of quality real-time and other computer bureau services to several blue chip organisations.

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A major enhancement of the twin CPU's together with a significant expansion of the intelligent terminal network will give further opportunity for the group (of four people) to develop their skills and give full job satisfaction.

If you have substantial system software experience (perhaps five years or more) and are seeking a technical challenge in a company that provides significant benefits in addition to salary, and has offices in an interesting part of Central London close to tubes and with easy access to mainline stations, then ring us, in confidence, quoting reference 315. (Messages will be recorded after hours.)

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52-53 Margaret St. London W1N 7FF 5796

COMPUTER WEEKLY
CHRISTMAS PUBLISHING
ARRANGEMENTS

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COMPUTER WEEKLY
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COMPUTER CENTRE - SYSTEMS GROUP

SYSTEMS
MANAGER

Applications invited for this post to head the Systems Group in the Computer Centre.

The Group is responsible for all systems programming aspects of supporting large ICL 1908A and DEC 2060 systems, various mini and micro systems, inter and intra campus networking, and a wide range of graphical devices. Applicants (m/f) should possess a good honours degree or its equivalent and preferably a higher degree. A number of years' experience in computing in a relevant environment is essential and successful candidates will be able to demonstrate explicit achievement in the provision of facilities in a full operational service.

Salary, according to age, qualifications and experience as Principal Computer Officer Scale C11165-£13080 plus superannuation. Further information obtainable from Director, Professor P. Jarrett - 021-472 1303, Ext. 2233.

Further particulars available from Assistant Registrar (Ext. and Enq.), P.O. Box 303, Birmingham, B15 2TT, to whom applications (3 copies) including full curriculum vitae and naming three referees, should be sent by Monday, December 22, 1980. Please quote ref: CV277. (2780)

METROPOLITAN BOROUGH OF
RochdaleAN EQUAL OPPORTUNITY EMPLOYER
TREASURER'S DEPARTMENTTECHNICAL SUPPORT
PROGRAMMER

A.P./S.O. 1 £8,760/£7,898 (from April 1981 £8,870/£8,139)

Rochdale is currently implementing VME/K to run on the 2860 Mainframe. Conversion work will be cut to a minimum by re-designing older systems. New developments are also planned.

Applications are invited from Programmers having a minimum of 2 years' experience. VME/K training will be given as required.

Application forms and further details are obtainable (by quoting ref. E317), from the Chief Personnel Officer, P.O. Box 88, Municipal Offices, Smith Street, Rochdale, OL16 1XG (telephone: Rochdale 47474; Ext. 662), to be received no later than Thursday, December 18, 1980.

UMIST

LECTURER IN SOFTWARE ENGINEERING

Ref: COM/224. A Lecturer is required in the Department of Computing, to take part in an ongoing programme of research and teaching in the area of software engineering. Applicants should have a PhD in computer science, or equivalent qualifications and experience, and should have interests in one or more of the following areas:

COMPUTER OFFICER IN SOFTWARE
ENGINEERING

Ref: COM/225. A Computer Officer is required in the Department of Computing, to carry out software development and maintenance in support of research and teaching in the area of software engineering. Candidates should have a degree or equivalent qualifications and experience, and should have interests in one or more of the following areas:

Salary will be within the range £4,195-£6,999 per annum. Details of application forms and further particulars, quoting the ref. number, should be addressed to the Registrar, Room 88, UMIST, PO Box 88, Manchester M60 1QD. The closing date is 1st January 1981. (2780)

Data Control
Supervisor

£6,275-£7,349 + Metropolitan weighting - Enfield

Eastern Gas of Enfield have just restructured various activities within the Management Services Department at their modern Tower Point offices in Enfield and now have an important position available in the Data Control Section.

Responsible for the day to day running of one of two Sections under the direction of the Data Control Officer, he/she will be mature and sufficiently experienced to be able to organise the daily batch work flow and re-runs, ensure training schedules are implemented and processed and that sections are manned adequately.

To qualify for this responsible position applicants should have a knowledge of 1900/2900's, at least four years relevant Data Control experience, two of which must have been in a supervisory capacity. There are definite career opportunities for someone who can learn quickly and is excited at the prospect of working on new machines and advanced systems.

Salary offered is in the range of £6,725 - £7,349 + £536 p.a. metropolitan weighting and a range of generous benefits, including subsidised staff restaurant, pension and sick pay schemes, etc.

For an early interview please contact:

The Personnel Department,
Eastern Gas,
Tower Point, Sydney Road,
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Tel: 01-866 1234.

EASTERN GAS

KUWAIT - MINI ENGINEER

c. £12,000 Tax Free + Benefits

A substantial Danish group has a well established computer services operation working in Kuwait and expansion has created the need for a further computer field engineer to be responsible for equipment servicing throughout the country. Installations comprise DEC PDP 11 and Systime CPU's, with CDC disc units and Tektronix/Calcomp graphic display units.

The company provides business computer systems, software consultancy and computer based telephone systems. Experienced engineers with a sound background of servicing these types of hardware will find this an exceptional opportunity to join an effective and expanding European group.

An attractive salary is offered for the area together with a comprehensive benefits package including car allowance, return air fares to home country for 1 month's holiday and free furnished, air conditioned accommodation. The appointment is initially for two years with 4 weeks bonus on completion and the option to continue.

The requirement is urgent and interviews will be conducted in the U.K. week commencing 16th December 1980.

Engineers having relevant experience should telephone immediately to discuss the requirement and how to apply. Either single or married status is acceptable. Please quote reference CW 164-C.

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